



# SHRIMATI INDIRA GANDHI COLLEGE

Nationally Accredited at 7<sup>th</sup> Grade (1<sup>st</sup> Cycle) by NAAC

An ISO 9001:2015 Certified Institution

Tiruchirappalli - 620 002

## **B.Sc.**

### **PROGRAM OUTCOME**

- UG Graduates exhibit livelihood competences in the field of Science and Technology in terms of relevant knowledge, skills and attitude.
- UG Graduates with an expected sense of being seasoned and spirited and tuned with required qualities of productive contribution to society.
- UG Graduates instilled with confidence shall rise up to take up leadership roles in the fields of science and Technology, given the occasion.
- UG Graduates realize the pursuit of knowledge is an integral part of a Lifelong activity towards successful life.
- UG Graduates are able to spread knowledge, create awareness about social evils and participate voluntarily in social and cultural activities.

### **PROGRAM SPECIFIC OUTCOMES:**

After the successful completion of B.Sc. Biochemistry program, the students are expected to

- 1 **PSO 1:** Broad based knowledge in biochemistry
- 1 **PSO 2:** Ability to understand the technical aspects of existing technologies that help in addressing the biological and medical challenges faced by humankind. Ability to contribute effectively in the development of the ethical practices, societal contributions, and leading to responsible and competent professionals
- 1 **PSO 3:** Ability to contribute effectively in the development of the ethical practices, societal contributions, and leading to responsible and competent professionals
- 1 **PSO 4:** Acquiring the ability of leadership skills to manage projects in multidisciplinary environments
- 1 **PSO 5:** To compete globally with confidence in all the sectors of life science.



**First Year**

**CORE COURSE I**

**Semester I**

**CELL BIOLOGY**

**Code: 22SCCBC1**

**(Theory)**

**Credit: 5**

## **COURSE OBJECTIVES:**

- To understand the basics and fundamentals of cell biology and biogenesis of cell organelles.
- To study the cellular processes and mechanisms that lead to physiological functions in normal as well as in pathological state.
- To make them understand the organization of cells and cell cycle.

## **UNIT – I BASICS OF CELL BIOLOGY:**

Discovery of Cell and Cell theory, Chemical Components of Cell. Structure of prokaryotic and eukaryotic cell and its differences, Comparison between Plant and animal cell.

## **UNIT – II CELL ORGANELLES:**

Structure and function of cell organelles – Nucleus, Endoplasmic Reticulum: RER and SER, Golgi complex, Chromosomes, Mitochondria, Ribosomes, Lysosomes, peroxisomes, Vacuoles, plastids, chloroplast. Microtubules and microfilaments.

## **UNIT – III CELL MEMBRANE:**

Cell Membrane: Composition, structure, models, Functions –Role in Transport. Specialized structures – Cell Junctions – Occluding, Anchoring and Gap, Ion channels.

## **UNIT – IV CELL CYCLE, CELL DEATH AND CELL RENEWAL:**

Cell Cycle –Cell division – Mitosis – Prophase, Metaphase, Anaphase, Telophase and Meiosis. Brief overview of apoptosis and necrosis; Aging and Senescence.

## **UNIT – V TOOLS OF CELL BIOLOGY:**

Cell Fractionation techniques: Principle of centrifugation, Sedimentation Coefficient, Differential and Density Gradient centrifugation. Cell Visualization techniques: Principle of Light microscope and Electron microscope. Staining techniques – dye and fluorescent based techniques.



## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Discussion on recent advancements like Crispr-Cas 9, recently developed cell imaging techniques, freeze fracturing technique, advanced microscopy techniques and recent noble prize awards in the field of medicine and physiology. Cellular abnormalities in various disorders like cancer.

### **Course Outcomes:**

1. Understand the cell theory and basic cell structure
2. Acquire knowledge on cell fractionation and cell visualization techniques
3. Illustrate the structure and function of various cell organelles in a cell.
4. Describe the structure, function and composition of cell membrane.
5. Understand the mechanism of cell division and cell death.



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## CELL BIOLOGY MAPPING

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC1: 1</b>	3	3	2	2	2
<b>22SCCBC1: 2</b>	3	2	2	2	2
<b>22SCCBC1: 3</b>	3	3	3	2	2
<b>22SCCBC1: 4</b>	3	3	2	-	2
<b>22SCCBC1: 5</b>	3	3	2	2	2
<b>Optimum Point</b>	3	3	3	2	2

  
Signature of the HoD  
The HoD  
Dept of Biochemistry  
Shrimati Indira Gandhi College  
Tiruchirappalli - 620 002





**First Year**

## **CORE PRACTICAL I CELL BIOLOGY**

**Code: 22SCCBC1P**

**(Practical)**

**Credit: 4**

### **COURSE OBJECTIVES:**

- To know handling of microscope
- To study practically the plant and animal cells, the cell organelles and components with the help of microscope
- To study staining techniques and study different stages of mitosis and meiosis

1. Handling of Microscope
2. Cytochemical staining of proteins by Methylene blue
3. Cytochemical staining of RNA by Methyl Green Pyronin
4. Cytochemical staining of polysaccharides by PAS
5. To study different stages of mitosis by temporary preparation in onion root tip
6. To study different stages of meiosis by temporary preparation in onion flower buds
7. Isolation of mitochondria from cabbage.
8. Staining of mitochondria
9. Separation of plant pigments by paper/Thin Layer chromatography.

### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

- 1. Gain the knowledge about handling of microscope
- | 2. Identify the microscopic examination of cell organelles
- 3. Obtain hands on training in basic separation techniques in Cell biology
- 4. Differentiate the stages of mitosis and meiosis
- 5. Evaluate the cellular biomolecules by staining techniques.



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## CELL BIOLOGY PRACTICAL MAPPING

### CO - PO matrices of course

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PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC1P:1</b>	3	3	2	2	2
<b>22SCCBC1P:2</b>					
<b>22SCCBC1P:3</b>					
<b>22SCCBC1P:4</b>					
<b>22SCCBC1P:5</b>					
<b>Optimum Point</b>					



**First Year**

**FIRST ALLIED COURSE I**

**Semester I**

**GENERAL CHEMISTRY**

**Code: 22SACBC1**

**(Theory)**

**Credit: 4**

### **COURSE OBJECTIVES:**

Students will gain an understanding of

- Chemical reactions and strategies to balance them
- The relative quantities of reactants and products
- The fundamental properties of atoms, molecules, and the various states of matter
- The electronic structure of atoms and its influence on chemical properties
- Molecular geometries of selected molecular species

### **UNIT – I CONCEPTS OF CHEMISTRY:**

Matter, States of matter, laws of chemical combination: Law of conservation of Mass, Law of definite proportions, Law of multiple proportions, Gay Lussac law of multiple proportions. Dalton's atomic theory, concept of elements, atoms and molecules. Atomic and molecular masses, mole concept and molar mass. percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry

### **UNIT – II ATOMIC STRUCTURE:**

Discovery of Electron, Proton and Neutron, atomic number and atomic mass number, Isotopes, Isobars and Isotones. Thomson's model and its limitations. Rutherford's model and its limitations, Bohr's model and its limitations, concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals - Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals

### **UNIT – III PERIODIC CLASSIFICATION OF ELEMENTS:**

Need for classification, early attempts at classification of elements (Dobereiner's Triads, Newland's Law of Octaves, Mendeleev's Periodic Table), Modern periodic table, gradation in

properties, valency, atomic number, metallic and non-metallic properties. Properties of elements -atomic radii, ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency. Nomenclature of elements with atomic number greater than 100.

#### **UNIT – IV CHEMICAL BONDING:**

Causes of chemical combination – stability and noble gas configuration, Ionic bond, covalent bond, coordinate Bond, polar covalent Bonds, Electronegativity, Electron affinity, localized and Delocalised Bonding, resonance effect, Inter Molecular forces, Intramolecular forces Vanderwaals and dipole forces. geometry of covalent molecules, VSEPR theory, concept of hybridization, involving s, p and d orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules (qualitative idea only), Hydrogen bond.

#### **UNIT – V OXIDATION-REDUCTION:**

Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number, Standard electrode potential and its applications in redox reactions

#### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

**Latest research and news:** Discussion on Topics awarded Nobel prize in Chemistry Short talk presenters and detailed discussion of their research contributions and articles in class.

#### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

- 1. Demonstrate an understanding of basic principles of chemistry and how they relate to everyday experiences.
- 2. Demonstrate problem solving and critical thinking skills
- 3. Apply methods of scientific inquiry.
- 4. Apply problem solving techniques to real-world problems.
- 5. Demonstrate an understanding of the chemical environment and the role that organic molecules play in the natural and the synthetic world.



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## GENERAL CHEMISTRY MAPPING

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PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SACBC1: 1</b>	3	2	3	3	2
<b>22SACBC1: 2</b>	2	3	2	2	3
<b>22SACBC1: 3</b>	2	2	3	2	3
<b>22SACBC1: 4</b>		2	2	2	3
<b>22SACBC1: 5</b>	1	2	2	2	3
<b>Optimum Point</b>	2	2	3	2	3





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First Year

FIRST ALLIED PRACTICAL I

Semester I

## GENERAL CHEMISTRY (Practical)

Code: 22SACBC1P

Credit: 2

### COURSE OBJECTIVES:

- To understand the preparation of reagents.
- To understand and analysis the identification of various chemicals
- To study quantitatively various kinds of molecules essential for life.

### VOLUMETRIC ANALYSIS

1. Estimation of Sodium hydroxide using standard Sodium Carbonate.
2. Estimation of Hydrochloric acid using standard Oxalic acid.
3. Estimation of Ferrous sulphate using standard Mohr's salt
4. Estimation oxalic acid using standard Ferrous Sulphate.
5. Estimation of Potassium permanganate using standard Sodium hydroxide.
6. Estimation of Magnesium using EDTA.
7. Estimation of Ferrous iron using diphenylamine as internal indicator.

### ORGANIC ANALYSIS

1. Detection of Elements (N,S, Halogens)
2. To distinguish between aliphatic and aromatic Saturated and unsaturated compounds.
3. Functional group tests for phenol, acids (mono, di) aromatic primary amine, amide, aldehyde & Carbohydrate Glucose.
4. Systematic analysis of organic compounds containing one functional group and characterization by confirmatory test.(Phenol/cresol, cinnamic acid, benzoic acid, phthalic acid, Succinicacid, benzamide, urea, glucose, benzaldehyde & aniline).

### COURSE OUTCOMES:

Upon successful completion of this course the students would be able:

- 1. Acquire skills of performing basic chemical tests important in laboratory investigations
- 2. Learn how to standardize various chemical reactions



- 3. Develop skills to prepare useful organic compounds in the laboratory
- 4. Apply the properties of functional groups of organic compounds.
- 5. To carry out selective organic reactions.

## GENERAL CHEMISTRY PRACTICAL MAPPING

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SACBC1P</b>	3	3	2	2	3





## CORE COURSE II MOLECULES OF LIFE

Semester II

First Year

Code: 22SCCBC2

(Theory)

Credit: 5

### COURSE OBJECTIVES:

- To expose the importance of biological macromolecules
- To study the influence and role of structure in reactivity of biomolecules
- To understand the role of biomolecules and their functions.

### UNIT – I CARBOHYDRATES:

Definition, classification – monosaccharide, oligosaccharides and polysaccharides; occurrence, structure and functions of monosaccharide (glucose and fructose). General properties with reference to glucose, anomer, epimer, enantiomer and mutarotation. Structure, occurrence, properties and biological importance of disaccharides (sucrose, lactose, maltose) and Polysaccharides- Storage polysaccharides (starch, glycogen), Structural polysaccharides (cellulose, chitin), Heteropolysaccharides (hyaluronic acid, heparin).

### UNIT - II AMINO ACIDS AND PROTEINS:

Amino acids- Definition, Structure, properties and classification based on structure, chemical nature. Essential and non essential amino acids. Proteins - Definition, classification based on shape, solubility, chemical composition, Properties and functions. Structure- Primary, Secondary, tertiary and quaternary.

### UNIT – III LIPIDS:

Structure, function and classification of lipids- simple, compound–glycolipids, phospholipids, spingo lipids and derived lipids - steroids. Fatty acids-Definition, structure, classification– saturated fatty acids, unsaturated fatty acids. Essential and non essential fatty acids. Physical and Chemical properties-emulsification, saponification number, rancidity, acid number, iodine number and Reichert – Meissl number.





## **UNIT – IV NUCLEIC ACIDS:**

Bases, nucleosides and nucleotides, phosphodiester linkage. Types of Nucleic acids –DNA and RNA; DNA – types-A, B, Z, double helical structure, properties and functions. Denaturation and renaturation. RNA – types-mRNA, tRNA, rRNA – structure and functions.

## **UNIT – V VITAMINS AND MINERALS:**

Source, classification, structure, daily requirement, deficiency manifestation and biological significances of fat soluble vitamins - A,D,E, K and water soluble vitamins-ascorbic acid, thiamine, riboflavin, pantothenic acid, niacin, pyridoxine, biotin, folic acid and cyanocobalamin. Minerals- Iron, Sodium, Potassium, Calcium, Phosphorus, Iodine, Zinc, Copper, Selenium.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

The RNA World and the Origins of Life.

### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

- 1. Gain the knowledge about the classification, structure, properties and functions of carbohydrates
- 2. Understand the classification, structure, properties and importance of amino acids
- 3. Acquire knowledge about the classification of proteins, levels of structural organization of proteins and its properties
- 4. Gain insights about the types, structure and properties of nucleic acids
- 5. Acquire knowledge about the classification, structure and properties of different types of lipids



## MOLECULES OF LIFE MAPPING

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC2:1</b>	3	2	2	2	2
<b>22SCCBC2:2</b>	3	2	2	2	2
<b>22SCCBC2:3</b>	3	2	2	2	2
<b>22SCCBC2:4</b>	3	2	2	2	2
<b>22SCCBC2:5</b>	3	2	2	2	2
<b>Optimum Point</b>	3	2	2	2	2



**First Year**

**CORE**

**PRACTICAL II**

**Semester II MOLECULES OF LIFE (Practical)**

**Code: 22SCCBC2P**

**Credit: 4**

### **COURSE OBJECTIVES:**

- To understand the preparation of reagents.
- To understand and analysis the identification of various biomolecules
- To study quantitatively various kinds of molecules essential for life.

### **QUALITATIVE ANALYSIS**

Weighing, reagents preparations – Normal, Molar and Percentage solutions, dilution (serial and Stock to working).

1. Qualitative analysis of carbohydrates (glucose, fructose, galactose, maltose, sucrose, lactose), Identification of both monosaccharides and disaccharides in mixtures.
2. Qualitative analysis of amino acids (Tryptophan, Tyrosine, Arginine, Proline, Phenylalanine and Histidine)
3. Qualitative analysis of Lipids-Solubility, Emulsification test, Saponification test, Acrolein test for Unsaturation, Test for Cholesterol-Salkowski test and Lieberman-Burchard test.

### **QUANTITATIVE ANALYSIS**

1. Estimation of reducing sugar by Benedict's quantitative method.
2. Estimation of amino acid by formal titration
3. Estimation of ascorbic acid by titrimetric method using 2,6-dichlorophenol indophenol dye.
4. Estimation of acid number of edible oil.
5. Determination of saponification number of edible oil.
6. Estimation of iodine value of edible oil.

### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

1. Acquire skills of performing basic biochemical tests important in clinical



investigations

2. Learn how to standardize various biomolecules
3. Develop skills to prepare useful organic compounds in the laboratory
4. Apply the properties of functional groups of organic compounds to carry out selective organic reactions
5. Analyze common organic reagents and compounds based on their properties

## MOLECULES OF LIFE PRACTICAL MAPPING

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

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PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC2P:1</b>	3	3	2	3	2
<b>22SCCBC2P:2</b>	3	3	3	3	3
<b>22SCCBC2P:3</b>	3	3	3	3	3
<b>22SCCBC2P:4:</b>	2	3	3	3	3
<b>22SCCBC2P:5</b>	3	3	3	3	3
<b>Optimum point</b>	3	3	3	3	3



**First Year**

**FIRST ALLIED COURSE II**

**Semester II**

**ORGANIC CHEMISTRY**

**(Theory)**

**Code: 22SACBC2**

**Credit: 4**

### **COURSE OBJECTIVES:**

Students will gain an understanding of

- The hybridization and geometry of atoms and the three-dimensional structure of organic molecules
- The reactivity and stability of an organic molecule based on structure, including conformation and stereochemistry
- An understanding of nucleophiles, electrophiles, electronegativity, and resonance
- The prediction of mechanisms for organic reactions
- How to use their understanding of organic mechanisms to predict the outcome of reactions

### **UNIT – I ORGANIC COMPOUNDS:**

Classification, and Nomenclature, Hybridization, Shapes of molecules, Influence of hybridization on bond properties. Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment; Organic acids and bases; their relative strength. Homolytic and Heterolytic fission with suitable examples. Curly arrow rules, formal charges; Electrophiles and Nucleophiles; Nucleophilicity and basicity; Types, shape and their relative stability of Carbocations, Carbanions, Free radicals and Carbenes. Classification of reactions: Addition, Substitution, Elimination, Condensation, and Polymerization. Oxidation Reduction – Elementary ideas only.

### **UNIT – II STEREOCHEMISTRY OF CARBON COMPOUNDS:**

Different types of isomerism, enantiomers and diastereoisomers; Fischer, Sawhorse, and Newman Projection formulae of simple molecules containing one and two asymmetric carbon atom. Asymmetric carbon atom, chirality, optical activity. Elements of symmetry, E and Z nomenclature, D and L nomenclature (for carbohydrates and aminoacids only). R and S nomenclature of one stereogenic centre.

### **UNIT – III Aliphatic & Aromatic Hydrocarbons:**

Aliphatic Hydrocarbons (Alkanes, Alkenes and Alkynes) Aromatic Hydrocarbons: Nomenclature, structure, physical properties and chemical reactions. Electrophilic addition reactions to C=C, mechanism of bromination and hydrohalogenation; Markownikoff's addition, peroxide effect. Hydration, hydroboration, ozonide formation, epoxidation, hydroxylation, General mechanism of electrophilic substitution reactions of benzene. Synthesis of aromatic compounds using nitration, sulphonation, Halogenation, Friedel-Crafts alkylations and acylation reactions. Halogenated Hydrocarbons.

### **UNIT – IV ALCOHOLS, PHENOLS AND ETHERS:**

Alcohols, Phenols, Ethers and Epoxide: Nomenclature, methods of preparation, physical and chemical properties (primary alcohols only) and uses (methanol and ethanol only).

### **UNIT – V ALDEHYDES, KETONES AND CARBOXYLIC ACIDS:**

Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses. Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Discussion on Topics awarded Nobel prize in Chemistry Short talk presenters and detailed discussion of their research contributions and articles in class.

### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

- 1. Demonstrate an understanding of basic principles of organic chemistry and how they relate to everyday experiences.
- 2. Demonstrate problem solving and critical thinking skills
- 3. Apply methods of scientific inquiry.
- 4. Apply problem solving techniques to real-world problems.
- 5. Demonstrate an understanding of the chemical environment and the role that organic molecules play in the natural and the synthetic world.



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## ❑ ORGANIC CHEMISTRY MAPPING

### - CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SACBC2: 1</b>	2	3	2	1	2
<b>22SACBC2: 2</b>	3	3	2	2	2
<b>22SACBC2: 3</b>	2	3	2	1	1
<b>22SACBC2: 4</b>	2	2	2	2	2
<b>22SACBC2: 5</b>	2	3	2	2	2
<b>22SACBC2: 6</b>	2	3	2	2	2
<b>Optimum Point</b>	3	3	2	2	2





## BIOCHEMICAL TECHNIQUES

### Semester II

#### COURSE OBJECTIVES:

- To provide insights in the techniques used in biochemical analysis
- To understand the basic principles behind the working of the common instruments used in the biochemical analysis
- To know the instrumentation of the common instruments used in the biochemical analysis

#### UNIT - I Chromatography:

Principles, Instrumentation and Applications - Paper, Thin Layer Chromatography, Column Chromatography, Ion exchange Chromatography, Molecular sieve Chromatography, Affinity Chromatography, High Performance Liquid Chromatography, Gas Liquid Chromatography.

#### UNIT – II Electrophoresis:

Principle, Instrumentation and Applications-Factors affecting electrophoretic mobility- Paper Electrophoresis, Agarose Gel Electrophoresis, PAGE, SDS PAGE, Iso electric focusing.

#### UNIT – III Centrifugation:

Principle, Instrumentation and Applications- RCF, Svedberg unit, Types of centrifuge and Rotors - Preparative, differential, density gradient, differential, Analytical ultracentrifugation – instrumentation and applications - Determination of molecular weight.

#### UNIT – IV Spectroscopy:

Principle, Instrumentation and Applications -Colorimeter, UV spectrophotometer, Flame Photometer, Atomic Absorption Spectrophotometer, Fluor meter.

#### UNIT – V Radioactivity:

Radioactive decay, Units of radioactivity, types of radiation, measurement of radioactivity - GM counter, Scintillation counter, Autoradiography, Applications of radioisotopes in biology.





## UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):

Application of techniques Eg. Usage of PCR in today's scenario

### COURSE OUTCOMES:

1. Understand the underlying principles of biochemical techniques
2. Comprehend the chromatographic techniques
3. Describe the principles of electrophoresis and realize its applications
4. Understand the process and applications of centrifugation
5. Perceive the utilization of radioactive material for analysis.

### BIOCHEMICAL TECHNIQUES MAPPING

#### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

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PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC3: 1</b>	2	2	3	-	3
<b>22SCCBC3: 2</b>	2	2	2	3	3
<b>22SCCBC3: 3</b>	2	3	2	2	2
<b>22SCCBC3: 4</b>	3	3	3	-	-
<b>22SCCBC3: 5</b>	3	3	-	-	3
<b>Optimum Point</b>	2	3	3	3	3



**Second Year**

**PRACTICAL III**  
**BIOCHEMICAL TECHNIQUES**

**Semester III**

**Code: 22SCCBC3P**

**(Practical)**

**Credit: 4**

**COURSE OBJECTIVES:**

- To provide hands on training in the techniques used in industries and research
  - To apply the principles studied
  - To make the students proficient in handling instruments
  - To familiarize the students to chromatography, centrifugation, electrophoresis and spectroscopy.
- 1 Separation of sugars and amino acids by paper chromatography
  - 2 Separation of amino acids and lipids by TLC
  - 3 Separation of leaf pigments by column chromatography
  - 4 Separation of serum protein by paper electrophoresis
  - 5 Separation of nucleic acid by agarose gel electrophoresis
  - 6 Estimation of carbohydrate by an throne method
  - 7 Estimation of ascorbic acid by colorimetric method
  - 8 Demonstration of Flame Photometer
  - 9 Demonstration of Sub cellular organelle separation by differential centrifugation

**COURSE OUTCOMES:**

- 1. The students will be able to handle Colorimeters,
- 2. The students will be able to handle the various instruments (Spectrophotometers, Centrifuge and Chromatographic units).
- 3. The students will be able to separate the sub cellular organelles.
- 4. The students will be able to apply the principles studied.
- 5. The students will be able to analysis the various samples in laboratories.



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## BIOCHEMICAL TECHNIQUES PRACTICAL MAPPING

### CO - PO matrices of course

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If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO 1
<b>22SCCBC3P:1</b>	3	3	2	2	2	3
<b>22SCCBC3P:2</b>	3	3	2	2	2	3
<b>22SCCBC3P:3</b>	3	3	2	2	2	3
<b>22SCCBC3P:4</b>	3	3	2	2	2	3
<b>22SCCBC3P:5</b>	3	3	2	2	2	3
<b>Optimum Point</b>	3	3	2	2	2	3



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**SECOND ALLIED COURSE I**  
**BASIC MICROBIOLOGY**

**Second Year**

**Semester III**

**Code: 22SACBC3**

**(Theory)**

**Credit: 4**

**COURSE OBJECTIVES:**

- Microbes are omnipresent, including as symbionts and commensals. This course provides a brief but thorough overview of the types of microbes, their distribution, diseases and control, as well as their beneficial applications
- It provides hands-on training in the basic skills necessary for sterile practices and the handling and manipulation of cultures in the microbiology laboratory

**UNIT – I Introduction and classification:**

Definition, scope and history of microbiology. Germ theory of disease. Differences between prokaryotic and eukaryotic microorganisms. Classification of Bacteria: based on Gram's staining, temperature and oxygen requirement. Types of bacteria: chlamydia, rickettsia, mycoplasma, actinomycetes, cyanobacteria and eubacteria. Brief overview of Archea.

**UNIT – II Viruses, fungi, algae and protozoans:**

Classification and types of viruses: Baltimore classification. General characteristics of major groups of fungi: Oomycota, Zygomycota, Ascomycota and Basidiomycota. Classification of protozoa: Mastigophora, Sarcodina, Sporozoa and Ciliophora. General characteristics of major groups of algae: Chlorophyta, Phaeophyta, Rhodophyta, Pyrrophyta, Chrysophyta and Euglenophyta.

**UNIT – III Microbial growth:**

Microbial growth, growth rate, doubling time and exponential growth phases. Factors affecting microbial growth: nutrient factors (C, H, N, O, P, S and trace elements) and non-nutrients (temperature, hydrostatic pressure, pH, osmotic strength). Types of nutrient media and special nutrient media. Differential media, and examples to distinguish between different groups of

bacteria using differential media. Streak plate, pour plate, Antibiotic sensitivity test.

**UNIT – IV Food and industrial microbiology:**

Quality control of drinking water: total coliform count. Microorganisms in milk and milk products, and the preservation of milk. Role of microbes in industrial production of fermented foods: alcoholic beverages, dairy products, coffee and chocolate. Preservation of wine. Single-cell proteins, microbial biofuel and biofertilizers.

**UNIT – V Microbial diseases and antimicrobial agents:**

Diseases caused by bacteria, viruses, protozoa and fungi: airborne diseases, water-borne diseases and milk-borne diseases. Prion diseases. Principles and methods of sterilization and disinfection. History, and brief overview of antibiotics, their mechanisms of action, and antibiotic resistance.

**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Chalk and talk: Occurrence of microbes in nature, Methods for isolation of microbes from spoiled vegetables and fruits.

**COURSE OUTCOMES:**

Upon successful completion of the course, students possess:

- 1. Foundational horizontal knowledge in microbiology
- 2. Awareness of communicable diseases, their mode of transmission, preventive and control measures, for public health awareness
- 3. The skill of handling microbial cultures, sterile practices and basic microbial techniques,
- 4. It will be useful in handling diseased samples in the biochemistry laboratory.
- 5. It will create knowledge in the field of food microbiology.



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## BASIC MICROBIOLOGY MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SACBC3: 1</b>	-	-	1	1	1
<b>22SACBC3: 2</b>	-	2	2	3	3
<b>22SACBC3: 3</b>	-	-	1	2	1
<b>22SACBC3: 4</b>	2	2	2	2	2
<b>22SACBC3: 5</b>	3	3	3	3	3
<b>Optimum Point</b>	1	1	1	2	2



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**Second Year**

**SECOND ALLIED PRACTICAL I  
BASIC MICROBIOLOGY**

**Semester III**

**Code: 22SACBC2P**

**(Practical)**

**Credit: 2**

**COURSE OBJECTIVES:**

- To gain knowledge regarding different microbiological techniques.
- To understand the principle and techniques for isolation procedure
- To understand the principle and procedure for staining techniques

1. Introduction to sterilization techniques- sterilization of glass wares, autoclaving.
2. Preparation of liquid and solid media
3. Isolation of Bacteria and fungi from soil samples – serial dilution technique
4. Measurement of bacterial population
5. Pure culture techniques: spread plate, streak plate technique and pour plate
6. Methylene blue reductase test (MBRT).
7. Determination of Bacterial growth curve
8. Identification of bacteria by morphological and Biochemical characteristics
9. Smear preparation and staining of bacteria: simple staining, Grams staining and spore staining
10. In vitro antibiotic sensitivity tests for selected bacterial cultures
11. Methods for preserving microbial cultures: slant, glycerol stock and lyophilisation.

**COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

- 1. Understand the microbial culture techniques
- 2. Understand the media preparation.



- 3. Acquire knowledge isolation and characterization techniques
- 4. Understand the mechanism sterilization and staining
- 5. It is helpful to the students who may work in the microbiological laboratories.

## BASIC MICROBIOLOGY PRACTICAL MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SACBC2P:1</b>	-	-	-	-	-
<b>22SACBC2P:2</b>	2	2	2	2	2
<b>22SACBC2P:3</b>	-	-	-	-	-
<b>22SACBC2P:4</b>	1	1	1	1	1
<b>22SACBC2P:5</b>	1	1	1	1	1
<b>Optimum Point</b>	1	1	1	1	1





Second Year

**NON MAJOR ELECTIVE I**  
**NUTRITIONAL BIOCHEMISTRY**

Semester III

**Code:**

**(Theory)**

**Credit: 2**

**COURSE OBJECTIVES:**

- To make the students aware of the basic nutrition
- To learn the basic food groups
- To understand the nutrient requirements for various age groups
- To learn the dietary requirements for diseases

**UNIT – I Nutrition:**

Definition, Food -definition, Functions of Food, Basic five food group, Food pyramid, Food facts and fallacies

**UNIT – II Types of Food:**

Nutrition-definition, Food -definition, Functions of Food, Basic five food group, Food pyramid, Food facts and fallacies

**UNIT – III Energy calculations:**

RDA, definition of energy, Cal, RQ, SDA, BMI, BMR, Methods to determine energy requirements and expenditure

**UNIT – IV Recommended Dietary Allowances:**

Nutritional requirements of Infants, Preschool, School going and Adolescents

**UNIT – V Dietary Recommendations:**

Nutritional requirement for Adult man and woman, Pregnant women, Lactating women, Old age. Therapeutic diets for anaemia, diabetes and heart disease

**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Preparation of diet charts for pregnant, lactating women and old age.



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## COURSE OUTCOMES:

- 1. Define the basic concepts of nutrition.
- 2. List the sources of various nutrients.
- 3. Explain the nutritional requirements for various age groups.
- 4. Discuss the health effects of nutrients.
- 5. Prepare menu charts for various diseases.

## NUTRITIONAL BIOCHEMISTRY MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SNMEBC1</b>	3	3	2	2	2
<b>22SNMEBC2</b>	3	3	2	2	2
<b>22SNMEBC3</b>	3	2	-	2	2
<b>22SNMEBC4</b>	2	3	3	-	2
<b>22SNMEBC5</b>	2	3	2	2	2
<b>Optimum Point</b>	3	3	3	3	2



Second Year

CORE COURSE IV

Semester IV

**BIOPHYSICAL  
CHEMISTRY**

Code: 22SCCBC4

(Theory)

Credit: 5

**COURSE OBJECTIVES:**

- To provide an insight on the physical laws governing biological systems
- To inculcate the basics of colloidal phenomena
- To make the students understand the methodology of pH measurement and its importance
- To provide details of thermodynamics and bioenergetics

**UNIT – I Ionization and pH measurement:**

Water -Physical Properties of water, structure of water, hydrogen bonding, dipole moment. Acids and bases - Ionization: Basis of acidity and basicity - Bronsted Lowry theory, Strength of acids and bases, acid-base equilibrium in water; electrolyte dissociation and electrolytes. Henderson Hassel Bach equation, Measurement of pH, reference electrodes, glass electrodes, pH meter, Buffers and buffers with biological importance.

**UNIT – II Colloids:**

Colloids-Classification and properties of colloids, salting in and salting out of proteins, Hofmeister series, Donnan Equilibrium. Diffusion-definition, Fick's law of diffusion, diffusion coefficient- determination and significance. Osmosis – definition, osmotic pressure-measurement, significance of osmosis in biology, osmoregulation.

**UNIT – III Viscosity:**

Viscosity-Factors affecting viscosity, measurement, applications and significance of viscosity in living systems. Surface Tension- Antonoff's rule-Factors affecting surface tension, measurement and role of pulmonary surfactants. Adsorption- Types of adsorption interactions, characteristics, Gibb's adsorption equation and significance of adsorption

**UNIT – IV Thermodynamics:**

Thermodynamics- First, second, third and zeroth law of thermodynamics, Law of mass action,

Oxidation reduction reactions, potentiometric titration of oxidation reduction reactions.  
Bioenergetics- Free energy and entropy changes in biological systems, coupling of endergonic and exergonic reactions, biological oxidation.

#### **UNIT – V Spectroscopy:**

Spectroscopy- Basic principles- Laws of absorption, deviations from Beer's law, Extinction coefficient, Absorption Spectrum, calibration curve, chromosphere concept, complimentary colors.

#### **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Presentation on absorption spectrum and performing simple experiments to demonstrate surface tension and viscosity.

#### **COURSE OUTCOMES:**

- 1. Develop a general understanding of how the physical laws govern biological systems/processes.
- 2. Acquire a basic knowledge on application of physical methods to understand biological processes.
- 3. Develop an understanding of colloidal phenomena.
- 4. To know the factors governing the structure and functions of macromolecules.
- 5. To comprehend the basic principles of thermodynamics.



## BIOPHYSICAL CHEMISTRY MAPPING

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC4: 1</b>	2	3	2	3	2
<b>22SCCBC4: 2</b>	2	3	3	3	2
<b>22SCCBC4: 3</b>	3	-	2	3	1
<b>22SCCBC4: 4</b>	3	2	-	2	2
<b>22SCCBC4: 5</b>	3	2	-	2	-
<b>Optimum Point</b>	3	2	3	3	3





**Second Year**

**CORE PRACTICAL IV**

**Semester IV**

**BIOPHYSICAL**

**CHEMISTRY**

**Code: 22SCCBC4P**

**(Practical)**

**Credit: 4**

### **COURSE OBJECTIVES:**

- To enable students to prepare buffers and measure pH
- To understand the separation of proteins
- To clearly learn osmosis, surface tension and viscosity
- To measure the absorption spectra of substances

- 1 Preparation of Buffers and measurement of pH
- 2 Titratable acidity of amino acids
- 3 Donnan Membrane equilibrium
- 4 Salting Out Process- Separation of Proteins
- 5 Exosmosis and Endosmosis
- 6 Osmosis with potato osmometer
- 7 Determination of surface tension using tween 60
- 8 Determination of surface tension using stalgmometer by drop number method
- 9 Determination of viscosity of a solution using Ostwald viscometer Absorption spectra of glucose, protein, ure

### **COURSE OUTCOMES:**

- 1. Students will be able to measure pH of solutions and prepare buffers.
- 2. Students will be able to calculate the titratable acidity of amino acids.
- 3. Determine the surface tension and viscosity.
- 4. Observe and record the absorption spectra of substances.
- 5. Can able to separate the proteins.



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## BIOPHYSICAL CHEMISTRY PRACTICAL MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC4P:1</b>	3	2	2	2	1
<b>22SCCBC4P:2</b>	2	3	3	3	3
<b>22SCCBC4P:3</b>	2	2	2	3	3
<b>22SCCBC4P:4</b>	2	2	3	2	3
<b>22SCCBC4P:5</b>	3	2	3	2	2
<b>Optimum Point</b>	2	2	2	2	3





Second Year

**SECOND ALLIED COURSE II  
MEDICAL MICROBIOLOGY**

Semester IV

Code: 22SACBC4

(Theory)

Credit: 4

## **COURSE OBJECTIVES:**

- To know the clinical aspects of various microbial diseases.
- To understand disease and causative agents.
- To understand the significance of diagnostic microbiology.
- To provide an advanced understanding of the microbial mechanisms and pathological processes responsible for common pathogens.

### **UNIT – I Microflora of the human body and host pathogen interaction:**

Normal microflora of the human body: Importance of normal microflora, normal microflora of skin, throat, gastrointestinal tract, urogenital tract Host pathogen interaction: Definitions - Infection, Invasion, Pathogen, Pathogenicity, Virulence, Toxicity, Carriers and their types, Opportunistic infections, Nosocomial infections.

### **UNIT – II Bacterial disease and Fungal diseases:**

Bacteria: The following diseases in detail with Symptoms, mode of transmission, prophylaxis and control Respiratory Diseases: S. pyogenes, M.tuberculosis Gastrointestinal Diseases: E. coli, S.typhi, Vibrio cholerae, H. pylori, S. aureus, , Clostridium tetani, botulinum. Fungi: following types of mycoses and one representative disease to be studied with respect to transmission, symptoms and prevention Cutaneous mycoses: Tinea pedis (Athlete's foot) Systemic mycoses: Histoplasmosis Opportunistic mycoses: Candidiasis.

### **UNIT – III Viral diseases and Protozoan diseases:**

The following diseases in detail with Symptoms, mode of transmission, control Polio, Herpes,





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Hepatitis, Rabies, Dengue, AIDS, Influenza with brief description of swine flu, Ebola, Chikungunya. Protozoan diseases. Symptoms, mode of transmission, prophylaxis and control  
Malaria, Kala-azar.

## **UNIT – IV Antimicrobial agents:**

General characteristics and mode of action, Antibacterial agents: Five modes of action with one example each: Inhibitor of nucleic acid synthesis; Inhibitor of cell wall synthesis; Inhibitor of cell membrane function; Inhibitor of protein synthesis; Antifungal agents: Mechanism of action of Amphotericin B, Griseofulvin. Antiviral agents: Mechanism of action of Amantadine, Acyclovir, Remdesvir, ganciclovir. Antibiotic resistance.

## **UNIT – V Sample collection, transport and diagnosis:**

Collection, transport and culturing of clinical samples, principles of different diagnostic tests, Diagnostic kits. (ELISA, Immunofluorescence, Agglutination based tests, Complement fixation, PCR, DNA probes).

## **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Chalk and talk about SARS, coronavirus, monkeypox, and black fungus. Preventive measures and treatment strategies.

## **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

1. Understand Mechanisms of various bacteria, viral infections.
2. Acquire the knowledge on the mechanisms of causation of diseases.
3. Explain the nature of the diseases.
4. Illustrate the significance of clinical microbiology.
5. The students can able to develop skills to facilitate employability in diagnostic and research institutes.

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## MEDICAL MICROBIOLOGY MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SACBC4: 1</b>	-	-	-	-	-
<b>22SACBC4: 2</b>	2	1	2	2	2
<b>22SACBC4: 3</b>	1	1	1	1	1
<b>22SACBC4: 4</b>	1	1	1	1	1
<b>22SACBC4: 5</b>	2	2	1	1	1
<b>Optimum Point</b>	1	1	1	1	1





Second Year

NON MAJOR ELECTIVE II

Semester IV

## CLINICAL BIOCHEMISTRY

(Theory)

Code:

Credit: 2

### COURSE OBJECTIVES:

- To know the clinical aspects of various metabolic disorders
- To understand the significance of diagnostic Biochemistry
- To provide an advanced understanding of the biochemical mechanisms and pathophysiological processes responsible for common biochemical disorders.

#### UNIT – I Body fluids:

Types of specimen - Blood, serum, plasma, urine, faeces, CSF, amniotic fluid, solid tissues, specific cells. Specimen collection and processing (Blood and Urine). Homeostasis, Disorders of fluids, electrolyte balance and gastrointestinal system, disorder involving changes in hydrogen ion concentration. Blood disorders- Anaemias, Sickle Cell Anemia, Thalassemia, Porphyrins and porphyrinurias. Disturbances in blood clotting - haemophilia A and haemophilia B.

#### UNIT – II Liver and Kidney disorders:

Liver disorders-Jaundice-Haemolytic, Hepatic and Obstructive Jaundice. Hepatitis, Cirrhosis. Liver function tests. Renal disorders- Glomerulonephritis, Renal failure and Nephrolithiasis. Renal function tests, normal and abnormal constituents of urine.

#### UNIT – III Disorders of Carbohydrate Metabolism:

Normal glucose level in blood, Blood glucose homeostasis: Role of tissues and hormones in the maintenance of blood glucose. Renal Threshold Value. Hyperglycemia and Hypoglycemia, Glycosuria, Diabetes Mellitus – classification, metabolic abnormalities, symptoms, complications, diagnosis-glucose tolerance test (GTT) and management. Glycogen Storage Diseases, Fructosuria, Galactosemia.

**UNIT – IV Disorders of Protein, Amino acid and Nucleic acid metabolism:**

Plasma proteins- variation in diseases. Nitrogen Balance, Proteinuria, Multiple Myeloma, Phenylketonuria, Alkaptonuria, Tyrosinosis, Albinism, Hartnups disease. Fanconic Syndrome, Cystinuria, LeschNyhan Syndrome, Gout, Hyperuricemia and Hypouricemia.

**UNIT – V Disorders of Lipid metabolism:**

Plasma lipoproteins, cholesterol triglycerides and phospholipids in health and disease, Fatty Liver, Atherosclerosis, Obesity, Lipid Storage Diseases, Hypolipoproteinemia and Hyperlipoproteinemia.

**UNIT – VI**

Biochemical and molecular epidemiology of human cancer (For continuous internal assessment only)

**COURSE OUTCOMES:**

Upon successful completion of this course the students would be able :

1. Understand the difference between plasma, serum, normal and abnormal constituents in various body fluids, Blood clotting mechanism and anticoagulants.
2. Acquire the knowledge on the mechanisms of causation of diseases of liver and kidney.
3. Explain the nature and functions of various enzymes in diseases.
4. Understand the clinical aspects of various metabolic disorders
5. Illustrate the significance of clinical biochemistry able to develop skills to facilitates employability in diagnostic and research institutes.



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## CLINICAL BIOCHEMISTRY MAPPING

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SNMEBC2:1</b>	3	2	-	2	-
<b>22SNMEBC2:2</b>	2	3	2	3	3
<b>22SNMEBC2:3</b>	2	3	-	3	-
<b>22SNMEBC2:4</b>	2	3	1	3	3
<b>22SNMEBC2:5</b>	3	3	3	3	3
<b>Optimum Point</b>	2	3	2	3	3



**Third Year**

**CORE COURSE V**

**Semester V**

**ENZYMES**

**Code: 22SCCBC5**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES:**

- To study the Classification and Nomenclature of enzymes and, specificity of enzyme
- To make them learn the enzyme kinetics, mechanism of enzyme action and factors affecting enzyme activity
- To make them understand the technique of immobilization.

**UNIT – I Introduction to Enzymes:**

Classification, nomenclature, properties and functions of Enzymes and Coenzymes Metallo enzymes and metal activated enzymes. Units of enzyme activity. Turnover number. Non-Protein enzymes-Ribozymes. Abzymes.

**UNIT – II Enzyme kinetics and Inhibition:**

Michaelis-Menten equation, Line weaver- Burke plots. Importance of  $K_m$  and  $V_{max}$ . Factors influencing enzymes activity. Enzyme inhibitors- reversible and irreversible inhibitors, Competitive, Non competitive and Uncompetitive inhibition. Feedback inhibition. Kinetics of Allosteric Enzymes.

**UNIT – III Mechanism of Enzyme action:**

Active site: Definition and characteristics- Lock & Key model and Induced fit model. Enzymes catalysis: acid base catalysis, covalent catalysis, metal ion catalysis. Specificity of enzyme action Formation of Enzyme – Substrate complex. Bisubstrate reactions-brief introduction to sequential and Ping-Pong mechanisms with example.Mechanism of action of Chymotrypsin and Lysozyme.

**UNIT – IV Isolation and Purification of Enzymes:**

Isolation- localization and extraction of free and membrane bound enzymes. Purification of

enzymes- Methods. Separation procedure based on molecular size, solubility difference and electric charge and selective adsorption. Fractionation of enzymes. Criteria of purity of enzymes.

#### **UNIT – V Applications of Enzymes:**

Immobilization of enzymes. Principles and various methods of immobilization - Ionic bonding, adsorption, covalent bonding, microencapsulation and gel entrapment. Applications of immobilized enzymes. Applications of enzymes in Industry. Clinical importance of enzyme.

#### **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Industrial importance of enzymes for cleaner and greener technology.

#### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

- 1. Understand the classification and nomenclature of enzymes, specificity of enzyme Catalysis and regulatory enzymes.
- 2. Explain the mechanism of enzymes and the role of vitamins as coenzyme precursors.
- 3. Express the Michaelis - Menten equation and graphical representation of various inhibitors.
- 4. Discuss the factors affecting enzyme activity and enzyme isolation & purification.
- 5. Describe the principles and methods of enzyme immobilization.



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## ENZYMES MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC5: 1</b>	3	3	-	3	2
<b>22SCCBC5: 2</b>	3	3	-	3	2
<b>22SCCBC5: 3</b>	3	3	-	3	2
<b>22SCCBC5: 4</b>	3	3	-	3	2
<b>22SCCBC5: 5</b>	3	3	-	3	2
<b>Optimum Point</b>	3	3	-	3	2





**Third Year**

**CORE COURSE VI**

**Semester V**

**MOLECULAR  
BIOLOGY**

**Code: 22SCCBC6**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES:**

- To learn about the basic principles of inheritance and the significance of the organization of genome mechanisms in the expression of genetic material and its regulation.
- To understand Molecular biology with nucleic acids and proteins and how these molecules interact within the cell to promote proper growth, division, and development.
- To emphasize the molecular mechanisms of DNA replication, repair and protein synthesis.

**UNIT – I Overview of genetic material:**

Structural organisation of chromatin, DNA as a genetic material-Griffith, Avery, McLeod and McCarthy and Hershey and Chase Experiments, concepts of gene, Chromosomal Structure (prokaryotic and eukaryotic)

**UNIT – II Replication of DNA:**

Models of DNA Replication (Prokaryotes and Eukaryotes) - Origin and direction of replication, discontinuous replication, Enzymes in DNA replication- DNA polymerases Primase, Ligase, Helicase, Topoisomerases. Singlestrand DNA binding protein, Replication strategies for replicating circular DNA:  $\phi$  mode replication,  $\sigma$  mode or rolling circle replication and D-loop replication. Inhibitors of replication.

**UNIT – III Transcription:**

Transcription (Prokaryotes and Eukaryotes)-RNA synthesis –initiation, elongation and termination - transcription activators and repressors, RNA Processing: splicing, polyadenylation, capping. Structure and functions of different types of RNA.

**UNIT – IV Translation:**

Genetic code –Codon and Anticodon interactions, Translation (Prokaryotes and Eukaryotes)

initiation, elongation, termination, translational inhibitors, post- translational modification of proteins.

#### **UNIT – V DNA Repair and Gene Regulation:**

Types of Gene mutations – Base substitution, Frameshift mutation-insertion, deletion, missense, nonsense mutation. DNA repair mechanism-Mismatch repair photoreactivation, excision and SOS repair. Regulation of Gene expression: Inducible operons – Lac Operon, Repressible operon – Tryptophan.

#### **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Latest research in the areas of gene expression and genome organization, cellular morphology and function, molecular metabolism, cellular trafficking, and signal transduction.

#### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

1. Understand and apply the principles and techniques of molecular biology.
2. Learn the most significant discoveries and theories through the historical progress of biological scientific discoveries, and their impacts on the development of molecular biology.
3. Acquire knowledge on the principles and laws of inheritance at the cell, individual and population levels.
4. Understand the concepts such as gene structure and function, gene regulation, microbial genetics, mutation and DNA repair, PCR and sequencing, cancer genetics and evolution.
5. Learn as to how gene expression is regulated at different levels, and as to how tissue-specific expression is achieved and can be manipulated and studied experimentally.



## MOLECULAR BIOLOGY MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC6: 1</b>	3	3	-	3	2
<b>22SCCBC6: 2</b>	3	3	-	3	2
<b>22SCCBC6: 3</b>	3	3	-	3	2
<b>22SCCBC6: 4</b>	3	3	-	3	2
<b>22SCCBC6: 5</b>	3	3	-	3	2
<b>Optimum Point</b>	3	3	-	3	2



**Third Year**

**CORE COURSE VII**

**Semester V**

**INTERMEDIARY METABOLISM**

**Code: 22SCCBC7**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES:**

- To make the students learn Bioenergetics with reference to how the living cells harness energy and channel it to biological work and to Metabolism, and as to how the cells extract and utilize energy through numerous enzyme-catalyzed reactions.
- To understand the major catabolic and anabolic pathways in metabolism of carbohydrates, lipids, amino acids and nucleotides.
- To make them the key regulatory aspects in metabolic pathways

**UNIT – I Bioenergetics:**

High energy phosphate compounds - structure and importance of ATP. Biological oxidation-Enzymes involved in oxidation and reduction. Electron transport chain, Inhibitors of ETC. Mechanism of oxidative phosphorylation, Inhibitors and Uncouplers.

**UNIT – II Carbohydrate metabolism:**

Glycolysis and its energetics, oxidation of pyruvate to acetyl CoA, Citric acid cycle and their regulation, anaplerotic reactions, Hexose MonoPhosphate pathway, gluconeogenesis, glycogenesis and glycogenolysis,

**UNIT – III Lipid metabolism:**

Biosynthesis and oxidation of fatty acids, biosynthesis and catabolism of triglycerides, phospholipids, glycolipids. Synthesis and catabolism of cholesterol. Synthesis and catabolism of ketone bodies. Metabolism of plasma lipoproteins- chylomicrons, LDL, VLDL, IDL and HDL.

**UNIT – IV Amino acid metabolism:**

Biosynthesis of essential and non-essential amino acids. Catabolism of essential and non-essential amino acids and their regulation. Glucogenic and ketogenic amino acids

Transamination, oxidative deamination, Decarboxylation, Urea cycle and its regulation.

**UNIT – V Nucleic acid and porphyrin metabolism:**

De novo synthesis of purines and pyrimidines, nucleotide and salvage pathway of purines and pyrimidine nucleotide synthesis. Catabolism of purines and pyrimidines nucleotides. Biosynthesis and catabolism of porphyrin and Heme.

**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

specific *events* in the *metabolism* and Inherited *Metabolic* Disorders. Metabolic Imaging in Humans (ICIMD).

**COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

1. Understand the basic principles of bioenergetics and mitochondrial mechanisms in energy production.
2. Appreciate the reaction pathways by which carbohydrates and lipids are synthesized and degraded.
3. Comprehend the metabolic fates of amino acids and the features of protein catabolism.
4. Know the biochemistry of porphyrins, purines and pyrimidines.
5. Discuss the overall concept of cellular metabolism – anabolic and catabolic pathways, energy storage and release, production of building blocks for macromolecule synthesis.



## INTERMEDIARY METABOLISM MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC7: 1</b>	3	-	1	2	-
<b>22SCCBC7: 2</b>	3	2	1	1	-
<b>22SCCBC7: 3</b>	3	-	1	2	-
<b>22SCCBC7: 4</b>	3	-	1	2	-
<b>22SCCBC7: 5</b>	3	-	1	2	-
<b>Optimum Point</b>	3	-	1	2	-





**Third Year**

**CORE PRACTICAL V**

**Semester V ENZYME**

## **KINETICS AND MOLECULAR BIOLOGY**

**Code: 22SCCBC5P**

**(Practical)**

**Credit: 4 COURSE**

### **OBJECTIVES:**

- To gain the knowledge regarding different analytical techniques for biomolecules
- To understand the principle and techniques for isolation procedure
- To estimate and analyze DNA and RNA using standard methods in body fluids.

1. Isolation of enzymes from natural sources.
2. Determination of specific activity, pH and temperature of salivary amylase.
3. Determination of effect of temperature on alkaline phosphatase activity.
4. Determination of the effect of pH on Urease activity.
5. Determination of  $K_M$  and  $V_{max}$  using Line weaver-Burk plot for any one enzyme.
6. Determination of activators for any one enzyme.
7. Determination of inhibitors for any one enzyme.
8. Isolation of DNA/RNA.
9. Estimation of DNA by Diphenylamine method.
10. Estimation of RNA by Orcinol method.

### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

1. Analyze the equations of enzyme kinetics.
2. Understand the principles of enzyme inhibition.
3. Evaluate the mechanism of enzyme catalysis.
4. Determine the catalytic mechanism employed by the most well characterized enzymes.
5. Understand the principles and procedures for isolation and evaluation of nucleic acids.



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## ENZYME KINETICS AND MOLECULAR BIOLOGY PRACTICAL MAPPING

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC5P:1</b>	3	3	2	3	3
<b>22SCCBC5P:2</b>	3	3	2	3	3
<b>22SCCBC5P:3</b>	3	3	2	3	3
<b>22SCCBC5P:4</b>	3	3	2	3	3
<b>22SCCBC5P:5</b>	3	3	2	3	3
<b>O Optimum point</b>	3	3	2	3	3





**Third Year**

**Semester V**

**MAJOR BASED ELECTIVE I**

**1. HUMAN PHYSIOLOGY**

**Code:**

**(Theory)**

**Credit: 4**

**22SMBEBC1A**

**COURSE OBJECTIVES:**

- To make the students understand fundamental mechanisms underlying normal function of cells and tissues.
- To make the students to understand fundamental mechanisms underlying normal function of organs, and organ systems of the human body
- To make the students to enrich on anatomy of few vital system

**UNIT – I Body fluids:**

Extracellular fluid-plasma and interstitial fluid. Intracellular fluid: Lymph and Blood-composition, functions, osmolarity of the body fluids, ionic composition. Blood cells, hemoglobin, haematopoiesis, blood coagulation and blood groups.

**UNIT – II Circulatory and Respiratory System:**

Structure of Heart and blood vessels, cardiac cycles, cardiac factors controlling blood pressure, electrocardiogram. Functions of heart. Anatomy of lungs and physiology of respiration, pulmonary surfactant, exchange of gases between lung and blood and between blood and tissues. Role of lung in acid-base balance.

**UNIT – III Digestive system:**

Anatomy of the digestive system, Salivary, Gastric and Biliary Secretions- composition and functions. Intestinal hormones, movements in Gastro intestinal tract, Secretion, digestion and absorption in the small intestine. Absorption in the large intestine; Digestion and absorption of carbohydrates, lipids and proteins

**UNIT – IV Excretory system:**

Outline of Excretory organs, Structure and functions of kidney. Structure of Nephron, Urine-composition and formation. Renal regulation of acid-base balance.

**UNIT – V Neuro Muscular System:**

General organization. Functional units. Resting and action potential- conduction of nerve impulse. Synaptic transmission. Neurotransmitters.

Muscle: Kinds of muscle, structure. Mechanism and theories of muscle contraction

**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Live 3D printed tissues and tissue implantation. Disorders in dementia and Alzheimer's disease.

**COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

1. Define physiology, main structures composing the human body.
2. Explain the functional anatomy of different organs in each system.
3. Relates structure and functions of tissues and body fluids.
4. Explain the structure of cardiac, digestive, excretory, respiratory systems.
5. Understand the features and organization of the various components of the nervous system and mechanisms of neurotransmission.



## HUMAN PHYSIOLOGY MAPPING

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SMBEBC1A: 1</b>	-	2	2	3	3
<b>22SMBEBC1A: 2</b>	2	3	2	3	3
<b>22SMBEBC1A: 3</b>	-	3	2	3	3
<b>22SMBEBC1A: 4</b>	-	3	2	3	3
<b>22SMBEBC1A: 5</b>	-	3	2	3	3
<b>Optimum Point</b>	2	3	2	3	3



**Third Year**

**MAJOR BASED ELECTIVE I**

**Semester V**

**2. BASIC BIOTECHNOLOGY**

**Code:**

**(Theory)**

**Credit: 4**

**22SMBEBC1B**

**COURSE OBJECTIVES:**

- To make the students to understand the technological aspect applied to fermentation technology,
- To make the students understand gene cloning, transgenic plants and animals.
- To make the students understand Applications of biotechnology for environmental issues.

**UNIT – I Fermentation Biotechnology:**

Biotechnology – scope and importance, Basic principles of microbial growth, Bioreactor- batch and continuous bioreactor, fermentation culture medium, downstream processing. Fermentation production of penicillin and vitamin B12.

**UNIT – II Food and Industrial Biotechnology:**

Fermentation production of yoghurt and cheese. Production of single cell protein; spirulina - cultivation and uses. Biofertilizers – blue green algae- cultivation and uses. Production of amylase and protease.

**UNIT – III Molecular Biotechnology:**

Basic principles of cloning, Introduction of foreign DNA into host by particle bombardment gun, electroporation and microinjection. Basic Polymerase Chain Reaction (PCR), applications.

**Unit – IV Animal and Plant Biotechnology:**

Elementary details of Animal cell and tissue culture, medium, targeted gene transfer. Transgenic animals (Knockout Mice, transgenic sheep with human alpha 1-antitrypsin gene, transgenic pigs for organs for humans, transgenic mosquitoes for disease control, transgenic chicken for high protein). Plant cell and tissue culture, medium, totipotent, pluripotent cells. Transgenic plants (enhancing photosynthetic efficiency, golden rice, BT cotton, herbicide tolerant plants, stress tolerant plants).

#### **UNIT – V Environmental Biotechnology:**

Biological fuel generation- ethanol and methane from biomass. Sewage treatment. Bioremediation: oil spill cleanup, bioleaching. Intellectual property management and handling of GMO's. Biosafety and hazards of environmental engineering.

#### **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Stem cell from bioreactors, Stem Cell Research, Human Genome Project.

#### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

1. Illustrate the various aspects of Biotechnological applications in Fermentation Industries.
2. Describe the principles underlying design of Fermenters, Fermentation Process and downstream processing and its applications.
3. Explain the concept of gene cloning
4. Explain the applications of transgenic plants and animals.
5. Explain the IPR and handling of GMO's



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## BASIC BIOTECHNOLOGY MAPPING

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SMBEBC1B: 1</b>	3	3	3	2	3
<b>22SMBEBC1B: 2</b>	3	3	3	2	3
<b>22SMBEBC1B: 3</b>	3	3	3	2	3
<b>22SMBEBC1B: 4</b>	3	3	3	2	3
<b>22SMBEBC1B: 5</b>	3	3	3	2	3
<b>Optimum Point</b>	3	2	3	2	3



**Third Year**

**SKILL BASED ELECTIVE I  
BIO-INSTRUMENTATION**

**Semester V**

**Code: 22SSBEB1**

**(Theory)**

**Credit: 2**

**COURSE OBJECTIVES:**

- To enable the students to have a deep knowledge on the techniques for measurement of biophysical factors in living organisms.
- To enable the students to get an insight on the usage of various techniques and their applications in industry and R&D.
- To develop competence in handling various chromatographic techniques and apply them in isolating and characterizing different biological molecules

**UNIT – I Spectroscopy:**

Beer Lambert's Law. Colorimeter-Principle, instrumentation and applications, UV-spectrophotometer - Principle, instrumentation and its applications. Principle, instrumentation and its applications of Atomic Absorption Spectrophotometer

**UNIT – II Chromatography:**

Definition, General Principles of chromatography – Adsorption and Partition. Principle, method and applications of paper chromatography, thin layer chromatography, Column chromatography, gel permeation chromatography

**UNIT – III Centrifugation:**

Cell disruption and homogenization-Media for homogenization, methods of cell disruption. Centrifugation - principle- sedimentation coefficient, RCF. Types of centrifuges and rotors. Preparative centrifugation – differential – separation of cell organelles.

**UNIT – IV Electrophoresis:**

Principles and applications of electrophoresis, Factors affecting electrophoretic mobility. Types

of electrophoretic techniques – paper electrophoresis and agarose gel electrophoresis. PAGE-SDS PAGE.

**UNIT – V Radioisotopes:**

Natural and artificial radioactivity, characteristics of radioactive elements, units of radioactivity, disintegration constant, half-life,  $\alpha$ ,  $\beta$  and  $\gamma$  radiation. Detection of radioactivity by GM counter. Applications of radioisotopes.

**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

To learn the separation of secondary metabolites from medicinal plants.

**COURSE OUTCOMES:**

1. Handle the instruments like colorimeter, spectrophotometer and to use them for biochemical determinations.
2. Separate proteins by gel filtration.
3. Understand about the principle and applications of spectrophotometry,
4. Apply various electrophoretic techniques such as gel, PAGE, etc. and their applications in analyzing proteins and nucleic acids.
5. Will be able to explain the basic principles of centrifugation, various types of centrifuges, rotors and methods for subcellular fractionation.





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## BIOINSTRUMENTATION MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SSBEBC1: 1</b>	3	2	3	2	3
<b>22SSBEBC1: 2</b>	3	2	3	3	3
<b>22SSBEBC1: 3</b>	3	2	3	2	3
<b>22SSBEBC1: 4</b>	3	2	3	3	3
<b>22SSBEBC1: 5</b>	3	2	3	2	3
<b>Optimum Point</b>	3	2	3	2	3



**Third Year**

**CORE COURSE VIII**

**Semester VI**

**IMMUNOLOGY**

**Code: 22SCCBC8**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES:**

- To study about the organs involved in the immune system, their biological functions.
- To understand the immunity and its types, immune response and immunoglobulins.
- To study about hypersensitivity reactions and the production of polyclonal and monoclonal antibodies and their application.

**UNIT – I Immune system:**

Primary Lymphoid organs- Thymus, Bone Marrow. Secondary Lymphoid organs- Spleen, lymph node, MALT. Stem cell- origin and differentiation, Lymphocytes- classification- T, B and NK cells. Antigen presenting cells-macrophages, dendritic cells, langerhans cell. Mechanism of phagocytosis. Complement system – characteristic features and functions.

**UNIT – II Immunity:**

Types of immunity- Innate immunity- mechanism of nonspecific immunity. Acquired immunity- active and passive immunity, classification, vaccine-active immunization, passive immunization. Humoral and cell mediated immunity –induction mechanism. Cytokines – interleukins, interferons.

**UNIT – III Immunoglobulins and immune reactions:**

Structure and types, biological functions. Antigen- Types –factors determining antigenicity. Antigen- antibody interactions - agglutination, precipitation, opsonization, complement activation, bacteriolysis and Antitoxins. Blood Groups.

**UNIT – IV Immune response:**

Hypersensitivity reactions- types, mechanism and prevention. Transplantation-types- graft acceptance- mechanism and prevention of graft rejection, immune-suppressive drugs. HLA-

immune response genes- HLA molecules, AIDS and Auto immune diseases- pathogenesis – treatment.

**UNIT – V Immunochemical techniques:**

Production of antisera, Monoclonal antibody- production and applications, Principle and applications of immunodiffusion, immunoelectrophoresis, immunofluorescence, and complement fixation test. Principle, technique and applications of RIA and ELISA.

**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Epidemiology and transmission dynamics of COVID-19.

**COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

1. Demonstrate the basic knowledge of immunological processes at a cellular level, compare and contrast the key mechanisms and cellular players of innate, adaptive immunity and how they relate.
2. Summarize central immunological principles, concepts and the mechanisms of protection against infectious diseases.
3. Outline key events and cellular players in antigen presentation, and how the nature of the antigen will shape resulting effectors responses.
4. Elucidate the genetic basis for immunological diversity and the generation of adaptive immune responses.
5. Comprehend and explain the basis of immunological tolerance, autoimmunity, transplantation and explain the basis of allergy, allergic diseases.
6. Understand all aspects of important techniques used for the study of immunological reaction.



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## IMMUNOLOGY MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC8: 1</b>	3	2	1	2	1
<b>22SCCBC8: 2</b>	3	2	1	2	1
<b>22SCCBC8: 3</b>	3	2	1	2	1
<b>22SCCBC8: 4</b>	3	2	1	2	2
<b>22SCCBC8: 5</b>	3	2	1	2	1
<b>Optimum Point</b>	3	2	1	2	1



**Third Year**

**CORE COURSE IX**

**Semester VI**

**CLINICAL BIOCHEMISTRY**

**Code: 22SCCBC9**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES:**

- To know the clinical aspects of various metabolic disorders
- To understand the significance of diagnostic Biochemistry
- To provide an advanced understanding of the biochemical mechanisms and pathophysiological processes responsible for common biochemical disorders.

**UNIT – I Body fluids:**

Types of specimen - Blood, serum, plasma, urine, feces, CSF, amniotic fluid, solid tissues, specific cells. Specimen collection and processing (Blood and Urine). Homeostasis, Disorders of fluids, electrolyte balance and gastrointestinal system, disorder involving changes in hydrogen ion concentration. Blood disorders-Anaemias, Sickle Cell Anemia, Thalassemia, Porphyrrias and porphyrinurias. Disturbances in blood clotting - haemophilia A and haemophilia B.

**UNIT – II Liver and Kidney disorders:**

Liver disorders-Jaundice-Haemolytic, Hepatic and Obstructive Jaundice. Hepatitis, Cirrhosis. Liver function tests. Renal disorders- Glomerulonephritis, Renal failure and Nephrolithiasis. Renal function tests, normal and abnormal constituents of urine.

**UNIT – III Disorders of Carbohydrate Metabolism:**

Normal glucose level in blood, Blood glucose homeostasis: Role of tissues and hormones in the maintenance of blood glucose. Renal Threshold Value. Hyperglycemia and Hypoglycemia, Glycosuria, Diabetes Mellitus – classification, metabolic abnormalities, symptoms, complications, diagnosis-glucose tolerance test (GTT) and management. Glycogen Storage Diseases, Fructosuria, Galactosemia.



## **UNIT - IV: Disorders of Protein, Amino acid and Nucleic acid metabolism:**

Plasma proteins- variation in diseases. Nitrogen Balance, Proteinuria, Multiple Myeloma, Phenylketonuria, Alkaptonuria, Tyrosinosis, Albinism, Hartnups disease. Fanconic Syndrome, Cystinuria, LeschNyhan Syndrome, Gout, Hyperuricemia and Hypouricemia.

## **UNIT – V Disorders of Lipid metabolism:**

Plasma lipoproteins, cholesterol triglycerides and phospholipids in health and disease, Fatty Liver, Atherosclerosis, Obesity, Lipid Storage Diseases, Hypolipoproteinemia and Hyperlipoproteinemia.

## **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Biochemical and molecular epidemiology of human cancer.

## **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

1. Understand the difference between plasma, serum, normal and abnormal constituents in various body fluids, Blood clotting mechanism and anticoagulants.
2. Acquire the knowledge on the mechanisms of causation of diseases of liver and kidney.
3. Explain the nature and functions of various enzymes in diseases.
4. Understand the clinical aspects of various metabolic disorders.
5. Illustrate the significance of clinical biochemistry able to develop skills to facilitates employability in diagnostic and research institutes.



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## CLINICAL BIOCHEMISTRY MAPPING

### CO - PO matrices of course

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC9: 1</b>	3	2	3	1	3
<b>22SCCBC9: 2</b>	2	-	1	-	1
<b>22SCCBC9: 3</b>	1	-	1	1	2
<b>22SCCBC9: 4</b>	1	2	3	1	3
<b>22SCCBC9: 5</b>	3	2	2	1	2
<b>Optimum Point</b>	3	2	3	1	3



**Third Year**

**CORE PRACTICAL VI**

**Semester VI**

**CLINICAL BIOCHEMISTRY AND IMMUNOLOGY**

**Code: 22SCCBC6P**

**(Practical)**

**Credit: 4**

**COURSE OBJECTIVES:**

- To provide an advanced understanding of parameters involved in biochemical disorders.
- To understand the immune response based on antigen and antibody reaction.
- To provide hands on training on Collection of samples, and quantitative and qualitative determination of blood and urine samples.

1. Collection and preservation of blood and urine
2. Determination of Blood count-RBC, WBC-Total and Differential counts
3. Estimation of Haemoglobin content
4. Determination of ESR.
3. Quantitative estimation in blood
  - a. Glucose
  - b. Protein & A/G ratio
  - c. Cholesterol
  - d. Urea
  - e. Uric acid
  - f. Bilirubin
  - g. Creatine and Creatinine
4. Qualitative analysis of normal and abnormal constituents of urine.
5. Quantitative estimations in urine
  - a. Glucose
  - b. Urea
  - c. Uric acid
  - d. Creatine and Creatinine
6. Identification of various immune cells by morphology–Leishman staining, Giemsa



Staining.

7. Agglutination Reactions- Latex Agglutination reactions- ASO, CRP.
8. Hemagglutination Reactions- Blood Grouping, Rh Typing

### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

1. Perform the hematology based analysis.
2. Explain the clinical significance of the laboratory tests.
3. Diagnosis of clinical disorders by estimating biomarkers.
4. Evaluate the abnormalities which commonly occur in the clinical field.
5. Identify abnormal constituents of urine.
6. Create awareness of different lifestyle diseases increasingly found in present day.



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## CLINICAL BIOCHEMISTRY AND IMMUNOLOGY PRACTICAL MAPPING

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCBC6P:1</b>	2	1	2	2	3
<b>22SCCBC6P:2</b>	1	1	3	2	3
<b>22SCCBC6P:3</b>	2	2	3	2	3
<b>22SCCBC6P:4</b>	1	2	2	3	2
<b>22SCCBC6P:5</b>	2	1	2	2	3
<b>Optimum Point</b>	2	1	3	2	3



**Third Year**

**MAJOR BASED ELECTIVE II**

**Semester VI**

**1. ENDOCRINOLOGY**

**Code:**

**(Theory)**

**Credit: 4**

**22SMBEBC2A**

**COURSE OBJECTIVES:**

- To obtain sound knowledge in hormonal biochemistry.
- To obtain knowledge on the mechanism of action of hormones.
- To understand the disorders related to hypo and hyper secretions of hormones.

**UNIT – I Introduction to Hormones:**

Definition, classification, biosynthesis and circulation in blood. Mechanism of hormone action. Plasma membrane receptors. Adenylate cyclase, Role of G- proteins. Protein kinases, tyrosine, kinase, Inositol phosphate. Calcium, calmodulin. Mechanism of steroid hormone receptors- Mechanism of action of steroid hormone

**UNIT – II Thyroid and Parathyroid Hormones:**

Hormones of the thyroid Biosynthesis and biological actions of thyroid hormones. Antithyroid agents. Thyroid disease- thyrotoxicosis, Goiter, Grave's disease Hashimoto's thyroiditis. Parathyroid hormone- Biological actions regulation of calcium and phosphorous metabolism. Calcitonin. Calcitriol- Biosynthesis and functions. Hyper and hypocalcemia. Hyperparathyroidism, hypoparathyroidism, Paget's disease. Ricket's and osteomalacia

**UNIT – III Hypothalamus and Pituitary Hormones:**

Vasopressin and oxytocin- synthesis and biological effects. Hypothalamic releasing factors. Anterior pituitary hormones actions. Growth promoting and lactogenic hormones. POMC family. Gigantism, Acromegaly, Dwarfism and Diabetes insipidus.

**UNIT – IV Pancreatic Hormones:**

Insulin- Biosynthesis, regulation of secretion and biological actions. Mechanism of action of

insulin. Glucagon, somatostatin and pancreatic polypeptide, Insulin like growth factors. Hyper and Hypoglycaemia.

#### **UNIT - V Adrenal Hormones:**

Glucocorticoids, Mineralocorticoids- synthesis and biological effects. Catecholamines: biosynthesis and biological effects. Gonadal hormones- Androgens and estrogens. Ovarian cycle. Abnormal secretion of adrenal hormones- Addison's disease. Cushing's syndrome, congenital adrenal hyperplasia, pheochromocytoma

#### **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Recent techniques for assessing hormones in blood. Drugs for hypo and hyper secretion disorders.

#### **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

1. Discuss the definition of a hormone in terms of its general properties.
2. Describe the different classes and chemical structures of hormones.
3. Identify the glands, organs, tissues and cells that synthesize and secrete hormones,
4. Explain how the secretion and regulation of hormones.
5. Explain the consequences of under- and overproduction of hormones.



## ENDOCRINOLOGY MAPPING

### CO - PO matrices of course

- K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SMBEBC2A: 1</b>	3	-	1	3	1
<b>22SMBEBC2A: 2</b>	2	-	1	2	-
<b>22SMBEBC2A: 3</b>	2	2	-	3	1
<b>22SMBEBC2A: 4</b>	2	2	-	3	-
<b>22SMBEBC2A: 5</b>	2	2	-	3	-
<b>Optimum Point</b>	2	2	-	3	-



**Third Year**

**MAJOR BASED ELECTIVE II**

**Semester VI**

**2. FOOD AND NUTRITION**

**Code:22SMBEBC2B**

**Credit: 4**

**(Theory)**

**COURSE OBJECTIVES:**

- To impart the knowledge on overview of nutrition, essential nutrients for metabolism
- To provide an overview of the important macro and micronutrients relevant to human health.
- To discuss the scientific rationale for defining nutritional requirements in healthy individuals with reference to specific conditions such as newborn, childhood, pregnancy, lactation, and older age.

**UNIT – I Overview of Food:**

Sources, food composition, properties and storage of common foods. Functions of food in relation to health- classification of foods based on nutrients. Food groups provide nutritive requirements for normal health- body building foods, energy foods and protective foods.

**UNIT – II Energy metabolism:**

Definition of unit of energy – cal, RQ, SDA and NPU. - Body Mass Index (BMI) - Basal Metabolic Rate (BMR) – determination and factors influencing The sources and functions of essential nutrients – proteins (high biological and low biological value), carbohydrates and fats. Sources and functions of dietary fibre, Pro and Prebiotics.

**UNIT – III Micro and macro mineral nutrients:**

Outline of sources, metabolic functions and deficiency manifestations – Calcium, Phosphorus, Sodium, Potassium, Iron, Copper, Selenium and Zinc. Fat and water soluble vitamins – Outline of sources, metabolic functions, Hyber and Hypovitaminosis. Role of Vitamin as Antioxidant

**UNIT – IV Dietary Recommendations:**

Concepts in dietary recommendations, RDA – ICMR and WHO- composition of balanced diet

and RDA for Infants, children, adolescents, pregnant and lactating women and old persons.

**UNIT – V Dietary Recommendations:**

Concepts in dietary recommendations, RDA – ICMR and WHO- composition of balanced diet and RDA for Infants, children, adolescents, pregnant and lactating women and old persons.

**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Sustainable & Environmentally-friendly Nutrition, Vegan & Plant-based Nutrition. Personalised Nutrition & Biohacking., Nutrition Confusion, Alternative Proteins. Health at Every Size & Mindful Eating.

**COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

1. Describe the composition and biochemical and physiological functions of the nutrients.
2. Explain the nutritional requirements at various stages of life.
3. Summarize the role of food in promotion of a healthy lifestyle and disease prevention role of food.
4. Assess the nutritional status of the community in order to determine the type magnitude and distribution of malnutrition.
5. Understand the therapeutic role of key nutrients in maintaining health.



# SHRIMATI INDIRA GANDHI COLLEGE

Nationally Accredited at 7<sup>th</sup> Grade (1<sup>st</sup> Cycle) by NAAC

An ISO 9001:2015 Certified Institution

Tiruchirappalli - 620 002

## FOOD AND NUTRITION MAPPING

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SMBEBC2B: 1</b>	3	2	2	2	2
<b>22SMBEBC2B: 2</b>	3	2	3	2	2
<b>22SMBEBC2B: 3</b>	3	2	2	3	2
<b>22SMBEBC2B: 4</b>	2	2	2	2	2
<b>22SMBEBC2B: 5</b>	2	3	2	2	2
<b>Optimum Point</b>	3	3	3	3	2





**Third Year**

**SKILL BASED ELECTIVE II**

**Semester VI**

**MEDICAL LAB**

**TECHNOLOGY**

**Code: 22SSBEB2**

**(Theory)**

**Credit: 2**

**COURSE OBJECTIVES:**

- To understand the basic concepts and to learn the techniques essential for clinical laboratory.
- To learn the methods of specimen collection
- To understand the concepts of histopathology
- To understand the basic requirements of a clinical lab technician and the quality control process

**UNIT – I Basic Haematology and Biochemistry:**

Specimen collection and handling, transportation of specimens, disposal of specimens after laboratory use. Composition of blood. Methods of estimation of Haemoglobin, total and differential count of WBC, Blood Group - methods of grouping and Rh factor. Levels of glucose, triglycerides, cholesterol in blood with clinical correlations. Urine normal and abnormal constituents.

**UNIT – II Microbiology:**

Microscopic examination, Gram staining, Culture media- preparation, pH adjustment, Making of culture plates, techniques of aseptic transfer, blood and urine culture. Antibiotic sensitivity tests. analysis of throat swab, sputum specimens, purulent exudates - Tuberculosis, Vibrio Cholera

**UNIT – III Histopathology:**

Tissue reception, labeling, fixation and section cutting, Preparation of paraffin blocks



(Dehydration, clearing, embedding, blocking). Handling and care of microtome, types of microtome, sharpening of knives, and section cutting. Frozen section techniques - CO<sub>2</sub> freezing, cryostat. Preparation of common stains. H & E, Congo red, methyl violet, Leishman stain, Giesma and staining techniques. Mounting of specimens, record keeping, indexing of slides.

## **UNIT – IV Immunology:**

Agglutination tests, Haemagglutination tests, Precipitation tests and Flocculation tests, Tests for RA factor, CRP, ASO, VDRL, Widal, Hepatitis, HIV testing and EBV. Serum electrophoresis.

## **UNIT – V Laboratory Automation and Quality Control:**

Functional components of clinical laboratories. Basic requirements of clinical laboratory technician. Maintenance of glassware and equipment. Quality assurance in a clinical laboratory. External QC and internal QC–Assessment- Corrective and preventive actions. Clinical validation and accreditation. Equipment calibration. Automation - advantages over manual methods. Automated analyzers. Lab informatics and scientific data management system - record keeping, coding and indexing.

## **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Demonstration all essential characteristics of a good lab technician and universal precautions of medical lab technology Learn other techniques like ELISA and autoanalyzer

## **COURSE OUTCOMES:**

1. Perform the basic hematology techniques and undertake biochemical analysis of clinical samples
2. Understand the tests performed in the clinical microbiology lab.
3. Undertake histological analysis of samples
4. Comprehend the basic techniques performed in clinical immunology laboratory.
5. Know about quality control, lab accreditation and automation.



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An ISO 9001:2015 Certified Institution

Tiruchirappalli - 620 002

## ☐ MEDICAL LAB TECHNOLOGY MAPPING

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

– If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SSBEBEC2: 1</b>	3	2	3	2	3
<b>22SSBEBEC2: 2</b>	3	2	3	2	2
<b>22SSBEBEC2: 3</b>	2	2	2	3	1
<b>22SSBEBEC2: 4</b>	2	3	2	3	3
<b>22SSBEBEC2: 5</b>	2	1	3	2	2
<b>Optimum Point</b>	2	2	3	2	2

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## M.Sc Biochemistry

### PROGRAMME OUTCOME (PO)

- PG Graduates are Professionally Competent with characteristic Knowledge bank, Skill set, Mind set and Pragmatic Wisdom in their Chosen fields.
- PG Graduates demonstrate the desired sense of being seasoned and exhibit unequivocal Spiritedness with excellent qualities of productive contribution to society and nation in the arena of science and technology.
- PG Graduates are mentored such that they exhibit Leadership attitude in their chosen fields with commitment to novelty and distinction.
- PG Graduates are directed in understanding of ethical principles and responsibilities, moral and social values in day-to-day life thereby attaining Cultural and Civilized personality.
- PG Graduates are able to collate information from different kinds of sources and gain a coherent understanding of the subject.

### PROGRAM SPECIFIC OUTCOME (PSO)

**PSO 1:** Understand the basic principles about the structure and function of macromolecules and their regulation in biological pathways. Students will also learn various techniques in Biochemistry, Immunology, Microbiology, Enzyme kinetics and Molecular Cell Biology.

**PSO 1:** Apply their skills in the field of biomolecules, their synthesis and breakdown and their clinical importance. Students will also acquire knowledge and understand diseases and their prevention.

**PSO 3:** Apply their skills in various clinical laboratories by experiencing a skillful knowledge during practicals. They can develop critical thinking skills to be capable of designing, carrying out interpreting scientific experiments.

**PSO 4:** The Degree creates a global platform for doing their higher studies and to set a career. The students are trained to undertake research projects in the field of life science.

**PSO 5:** Understand the concepts of cellular signal transduction pathways and the association of aberrant signal processes with various diseases. Acquire insight into the immune system and its responses, and use this knowledge in the processes of immunization, vaccine development, transplantation and organ rejection.



First Year

CORE COURSE I

Semester I

## CHEMISTRY OF BIOPOLYMERS

Code:

(Theory)

Credit: 5

P22BCCC11

### COURSE OBJECTIVES:

- To understand the structure and functions of important biological macromolecules.

#### UNIT – I HOMO AND HETEROGLYCANS:

Polysaccharides - occurrence, structure, properties and functions of homoglycans - starch, glycogen, cellulose, dextrin, inulin, and chitin. Occurrence, structure, properties and functions of heteroglycans - hyaluronic acid, keratan sulphate and chondroitin sulphate. Bacterial cell wall polysaccharides, Blood group substances, Sialic acid, Glycoproteins, Lectins - biological functions.

#### UNIT – II PROTEINS:

Classification, structure and properties of amino acids, Essential and non- essential amino acids. Non protein amino acids. Proteins - Classification based on solubility, shape, composition and function. Properties of proteins. Denaturation and renaturation of proteins. Structure of peptide bonds. Chemical synthesis of polypeptides. Protein structure - Primary, secondary, tertiary and quaternary structures of protein. Forces stabilizing the secondary, tertiary and quaternary structures of proteins. **Ramachandran Plot** Structure and biological functions of fibrous proteins (keratins, collagen and elastin), globular proteins (haemoglobin, myoglobin).

#### UNIT – III LIPIDS:

Definition and classification of lipids. Fatty acids - classification, nomenclature, structure and properties. Triacylglycerols. Classification, structure and function of prostaglandins. Chemical properties and functions of phospholipids and their structures - lecithins, cephalins, phosphatidylserine, phosphatidylinositol, plasmalogens. Glycolipids (cerebrosides and gangliosides), Isoprenoids and sterols (cholesterol), bile acids and bile salts. Types and functions of plasma lipoproteins.



## **UNIT – IV      NUCLEIC ACIDS:**

Structure of purines and pyrimidines. Components of nucleic acids - nucleosides, nucleotides, and polynucleotides. Isolation of nucleic acids. Properties of DNA: buoyant density, viscosity, hypochromicity, denaturation and renaturation– the cot curve. Chemical synthesis of oligonucleotides. DNA: structure of different types (A, B and Z DNA), biological role. Structure and role of different types of RNA.

## **UNIT – V      VITAMINS AND PORPHYRINS:**

Structure and biochemical properties of water soluble and fat soluble vitamins and their coenzyme activity. Macro minerals (Ca, P, Mg, Na, K, Cl) and micro minerals/trace elements (Co, I, Fe, Mn, Zn, and F) - their sources, daily requirements, functions and deficiency diseases symptoms. Porphyrins the porphyrin ring system, chlorophyll, haemoglobin, myoglobin and cytochrome.

## **UNIT – VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent developments in the design of biomolecule based nanostructures in clinical research.

## **COURSE OUTCOME:**

1. The students will be able to understand the source, chemical structure, properties, function and uses of various polysaccharides.
2. The students will be able to understand amino acid structures, their physical and chemical properties, and primary, secondary, tertiary and quaternary structure of proteins.
3. The students will be able to understand amino acid structures, their physical and chemical properties of lipids.
4. The students will understand the structure of nucleic acids and its chemical synthesis.
5. The students will understand the biological importance of vitamins and minerals in the biological system.



## CHEMISTRY OF BIOPOLYMERS

### MAPPING

#### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC11:1</b>	3	3	2	2	-
<b>P22BCCC11:2</b>	3	3	2	2	-
<b>P22BCCC11:3</b>	3	3	2	2	-
<b>P22BCCC11:4</b>	3	3	2	2	-
<b>P22BCCC11:5</b>	3	3	2	2	-
<b>Optimum Point</b>	3	3	2	2	-





**First Year**

**CORE COURSE II**

**Semester I**

**BIOCHEMICAL TECHNIQUES**

**Code: P22BCCC12**

**(Theory)**

**Credit: 5**

## **COURSE OBJECTIVES:**

This course will introduce some of the experimental techniques used in biochemistry and molecular biology.

Students are able to learn methods for purifying proteins, expressing recombinant proteins in bacterial cells, and analyzing biological molecules by electrophoresis, Western blotting, and enzyme activity assays.

### **UNIT – I UNITS OF MEASUREMENT OF SOLUTES IN SOLUTION:**

Normality, Molarity, molality and milliosmol. Ionic strength. pH, pOH, Henderson – Hesselbalch equation, buffers, pH of body fluids. Measurement of pH by indicators, Zwitterions. pH dependent ionization of amino acids and proteins. Viscosity, surface tension and Donnan membrane equilibrium. Principles of electrochemical techniques – measurement of pH by glass electrode and hydrogen electrode. Oxygen electrode – principles, operation of a Clarke electrode and its applications.

### **UNIT – II CELL FRACTIONATION TECHNIQUES AND RADIO ISOTOPE TECHNIQUES:**

Cell lysis, differential and density gradient centrifugation, Salting in, Salting out, Dialysis, Ultrafiltration. Ultra Centrifugation - preparative and analytical ultracentrifuge, Svedberg's constant, Sedimentation velocity and Sedimentation equilibrium, Schlieren optics. Radioisotope technique: Radioactive decay constant, half life of an isotope, Detection and measurement of radioactivity, Geiger Muller counters, scintillation counting, auto radiography and RIA, Application of isotopes in biological studies.

### **UNIT – III CHROMATOGRAPHIC TECHNIQUES:**

Principles, Instrumentation and Applications of Paper, Column, TLC, Adsorption, Ion exchanges, Gel filtration, Affinity, GLC, Chromato focusing, HPLC, FPLC.

### **UNIT – IV ELECTROPHORETIC TECHNIQUES:**

Polyacrylamide gel electrophoresis, SDS-PAGE, 2D – PAGE, Isoelectric focusing, Visualizing





protein bands – CBB & Silver staining. Agarose gel Electrophoresis, pulse field electrophoresis, high voltage electrophoresis, Capillary Electrophoresis, RFLP, FISH. Blotting techniques and its applications – Western, Northern & Southern.

## **UNIT – V      SPECTROSCOPIC TECHNIQUES:**

**Spectroscopic technique:** Colorimetry, spectrophotometry – UV & visible, Principle – Beer Lambert's law, Extinction coefficient. Principle Instrumentation and application - AAS, Fluorimetry. Basic principle and application of mass spectra, NMR, ESR, MS, MALDI-TOF, MRI, CTscans. Biochips (DNA chips, Protein chips and Sensor chips). Vibration Spectra – IR – Principles and Applications. X-ray crystallography – protein crystals, Bragg's law.

## **UNIT – VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Application of analytical techniques in diagnostics. Ex: qRT-PCR and its application with specific context to identification of Covid-19 infection.



## COURSE OUTCOME:

1. To be able to communicate and discuss General principles of biochemical investigation
2. Familiarity with working principles, tools and techniques of analytical techniques
3. Familiarity with working principles, tools and techniques of electrochemical techniques.
4. Students can understand the knowledge for the separation of proteins/peptides by selecting appropriate separation techniques.
5. Students are able to characterize certain functionalities of biomolecules by using spectroscopic techniques.

## BIOCHEMICAL TECHNIQUES MAPPING

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

### M.Sc. Biochemistry

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC12:1</b>	3	3	2	3	3
<b>P22BCCC12:2</b>	3	3	2	3	3
<b>P22BCCC121:3</b>	3	3	2	-	3
<b>P22BCCC12:4</b>	3	3	-	-	3
<b>P22BCCC12:5</b>	3	3	-	-	3
<b>Optimum point</b>	3	3	2	3	3





First Year

CORE CHOICE COURSE I

Semester I

## 1) CELL BIOLOGY

Code: P22BCCC1A

### COURSE OBJECTIVES:

- The Cell Biology course will enable you to consider the most exciting current problems in the field. This course will give you a unique opportunity to study the mechanisms that define and regulate the function of cells and organisms.
- As this is a research-focused master's course, one will take an interactive approach to learning, rather than taking traditional lectures, through seminars, small group tutorials and research placements.

### UNIT – I THE CELL:

Cell theory, Protoplasm and Organismal theory, Broad classification of cell types – Bacteria, Archaea (Prokaryotes) and Eukaryotes. *Cell Membranes*: Basic properties of Cell Membranes – The lipid Bilayer: Composition and Structural Organization, Membrane proteins: Structure and basic functions, Membrane transport of small molecules and the electrical properties of Membranes, Endocytosis and Exocytosis. Specialized structures - Cell Junctions – Occluding, Anchoring and Gap, Ion channels. The plant Cell wall.

### UNIT – II CELL ORGANELLES:

Organelles bounded by Double membrane Envelopes [Nucleus and Mitochondria], Organelles bound by single membrane [Peroxisome, ER, GA, Lysosomes], Ribosomes, Dictyosomes, Microbodies, Peroxisome, Plastids- Chloroplast, Chromoplast and Leucoplast. Vacuoles and Centrosomes.

### UNIT – III INTERNAL ORGANIZATION OF THE CELL:

*The Cytoskeleton*: Components of Cytoskeleton, Structure and basic functions of Microtubules, Microfilaments, Intermediate filaments. *Cell Communication*: Cell- Cell Junctions, Tight Junction, Gap Junction, Cell – Matrix Anchoring junctions: Desmosomes, Adhering Junctions. Cell-Cell Adhesion proteins: Cadherins, Catenins, Integrins, Selectins. Plasmodesmata in Plants. The extracellular Matrix of Animals, Collagens, Elastins, Fibronectin, Laminin.



## **UNIT – IV CELL CYCLE:**

Overview of Cell cycle: Mitosis and Meiosis, Stages of Mitosis and Meiosis, Crossing over and Linkage. Model organisms and methods to study the cell cycle. Regulation of CDK activity and role of checkpoints. Apoptosis and Cancer.

## **UNIT – V STEM CELLS:**

*Overview/Concepts:* Introduction to Concepts in Stem Cell Biology-Potency, Plasticity, Self Renewal and Expansion, Properties, Stem Cells. Classification and Sources. Embryonic Stem cells, Stem cell Morphology Differentiation, Origin and Types of Stem cells. Stem cells and Tissue Renewal.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

### **Applications and methods in cell biology**

Microscopy: Light microscopy, fluorescent microscopy, confocal microscopy, Phase contrast microscopy, electron microscopy. SEM, TEM. Freeze fracture technique, FACS, TUNEL assay, comet assay, clonogenic assay and cell toxicity assays.

### **COURSE OUTCOME:**

1. To be able to communicate and discuss the structure of cell
2. Familiarity with structure and functions of organelles.
3. Students can understand the knowledge cell to cell communication
4. Students are able to understand the cell cycle.
5. Students will demonstrate their mastery of stem cell biology concepts.

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## CELL BIOLOGY MAPPING

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC1A:1</b>	3	2	2	3	2
<b>P22BCCC1A:2</b>	3	2	2	3	3
<b>P22BCCC1A:3</b>	3	2	2	3	3
<b>P22BCCC1A:4</b>	3	2	2	3	3
<b>P22BCCC1A:5</b>	3	2	2	3	2
<b>Optimum Point</b>	3	2	2	3	3





**First Year**

**CORE CHOICE COURSE I**

**Semester I**

## **BIOTECHNOLOGY AND GENETIC ENGINEERING**

**Code: P22BCCC1B**

**Credit: 5**

### **COURSE OBJECTIVES:**

- . This course is to discipline to students knowledge of main engines of implementation and transmission of a genetic material at molecular and cellular levels
- i. The methods of change of a genetic material and construction of transgenic organisms with the given properties.
- ii. Students can understand the natural function of restriction endonucleases and how a normal bacterial cell protects its DNA from their activity. Understand the value of and the processes involved with the polymerase chain reaction (PCR).
- 1. To understand the function of creative use of modern tools and techniques for manipulation and analysis of genomic sequences.

### **UNIT – I INTRODUCTION TO GENE CLONING:**

Restriction and modification enzymes. Cloning vectors: Characteristics, Natural & artificial plasmids as vectors) pBR322, pUC, shuttle vector and cosmids - advantages and disadvantages. Vectors used for cloning in E.coli., yeast, higher plants (Ti plasmid derivatives, caulimovirus) and animal cells (constructs of SV 40 and retroviruses). Expression vectors. Screening of recombinants. Construction of DNA libraries - genomic and cDNA libraries.

### **UNIT – II TRANSGENICS:**

Transgenic animals - Gene transfer methods in animals. Totipotency, haploids, growth of animal cell lines. Competent cells preparation, electroporation, microinjection and particle bombardment method, and applications. Transgenic plants - Use of agrobacterium for genetic engineering in plants. Plant cell cultures for the production of important compounds. Plant tissue culture – Micropropagation, protoplast isolation, somatic hybrids. Identification of

transformed cells into callus and regeneration of transgenic plants and applications.

### **UNIT – III MOLECULAR TECHNIQUES:**

Polymerase chain reaction – principle, types and applications. Sanger's and Maxam-Gilbert's method for DNA sequencing. DNA Fingerprinting - RAPD, RACE (Rapid Amplification of cDNA Ends), RFLP and AFLP analysis and its application in forensic science. DNA footprinting. Chromosome walking, chromosome jumping. Mutagenicity test – Ames test. Markers linked to drug and disease resistant genes. Antisense technology and its application. Microarray technology: genomic and cDNA arrays. (<https://www.slideshare.net/drmalathi13/molecular-techniques>)

### **UNIT – IV GENE THERAPY:**

*Ex-vivo, In vivo, In situ* gene therapy Strategies of gene therapy: Gene augmentation – ADA deficiency, CFTR, Antisense therapy, Ribozymes, Protein Aptamers, Intrabodies. Stem cell therapy - Embryonic and adult Stem Cells, Totipotent, Pluripotent and Multipotent Cells. Testing and generation of embryonic stem cells, Testing for adult stem cells and differentiation, Potential use of stem cells – Cell based therapies.

### **UNIT – V GENOME PROJECT AND BIOETHICS:**

Human genome projects, gene bank. Genetically modified organisms (GMOs) in developed and developing countries. Genetically modified foods – benefits and risks. Bioethics: Laws and regulations in biotechnology, patent laws, and Intellectual property rights (IPR). Biosafety, types of biosafety, advantages and disadvantages. Ethics in cloning and stem cell research.

### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

#### **Therapeutic application of genetic engineering tools:**

Discuss on recent techniques in genetic engineering that help understand diseases and treating the same

### **COURSE OUTCOME:**



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- The course covers the fundamentals of genome, gene cloning and gene transfer techniques.
- Students will understand the general plant tissues culture technique along gene therapy strategies.
- Students will understand the basic molecular techniques and techniques involved in the field of forensics.
- Students will understand the concepts of gene therapies
- The course also covers the human genome project and biosafety levels which enables the students to acquire good laboratory practices.





## BIOTECHNOLOGY AND GENETIC ENGINEERING MAPPING

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-”

### M.Sc. Biochemistry

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC1B:1</b>	2	3	3	-	3
<b>P22BCCC1B:2</b>	2	3	3	-	3
<b>P22BCCC1B:3</b>	2	3	3	-	3
<b>P22BCCC1B:4</b>	2	3	3	-	3
<b>P22BCCC1B:5</b>	2	3	3	-	3
Optimum Point	2	3	3	-	3





**First Year**

**CORE PRACTICAL I**

**Semester I**

## **BIOCHEMICAL TECHNIQUES AND**

## **ENZYMOLGY**

**Code: 22BCCC1P**

**(Practical)**

**Credit: 3**

### **COURSE OBJECTIVES:**

- To assay the activity of enzymes from different sources.
- To stimulate their interest in learning the structure, function and kinetics of enzymes and their role as catalyst and regulator of cell metabolism and to serve as foundation for more advanced enzymology courses.

### **EXPERIMENTS:**

1. Estimation of proteins by Lowry / Bradford method
2. Estimation of phospholipids by phosphorus assay
3. Demonstration of - Estimation of sodium and potassium by Flame photometry
4. Effect of pH, temperature and substrate concentration for amylase and urease and determination of  $V_{max}$  &  $K_m$
5. Effect of inhibitor on activity of any one enzyme
6. Effect of activator on activity of any one enzyme
7. Desalting of proteins by dialysis
8. Separation of polar and non polar lipids by TLC
9.  $R_f$  value calculation of various amino acids using TLC and PC
10. Separation of proteins by SDS PAGE

### **COURSE OUTCOME**

1. Students able to estimate macromolecules like proteins and phospholipids
2. students able to separate polar and nonpolar compounds by TLC and PC
3. Able separate protein by electrophoresis
4. Able to do and understand the activity of enzymes under different conditions.
5. Able to desalt the proteins by dialysis



## BIOCHEMICAL TECHNIQUES AND ENZYMOLOGY

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

### M.Sc. Biochemistry

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC1P:1</b>	3	3	2	2	3
<b>P22BCCC1P:1</b>	3	3	2	2	3
<b>P22BCCC1P:1</b>	3	3	2	2	3
<b>P22BCCC1P:1</b>	3	3	2	2	3
<b>P22BCCC1P:1</b>	3	3	2	2	3
<b>optimum Point</b>	3	3	2	2	3





**First Year**

**ELECTIVE COURSE I**

**Semester I**

**1) BIOSTATISTICS**

**Code: P22BCE1A**

**(Theory)**

**Credit: 4**

**COURSE OBJECTIVES:**

- The course emphasizes various statistical methods and its significance.
- The students are expected to understand the concepts and solve relevant problems pertaining to each topic.
- To provide sufficient background to be able to interpret statistical results in research.

**UNIT – I STATISTICAL SURVEY:**

Organizing, planning and executing the survey. Source of data - Primary and secondary data, collection, observation, interview, enquiry forms, questionnaire schedule and checklist. Classification and tabulation of data. Diagrammatic and graphical presentation of data.

**UNIT – II MEASURES OF CENTRAL TENDENCY:**

Arithmetic mean, median, mode, quartiles, deciles and percentiles. Measures of variation - range, quartile deviation, mean deviation, standard deviation, Coefficient of variation. Correlation analysis - Scatter diagram, Karl's Pearson's coefficient of correlation and Spearman's rank method. Regression analysis.

**UNIT – III PROBABILITY:**

Definition, concepts, theorems (proof of the theorems not necessary) and calculations of probability - Simple problems. Theoretical distributions – Binomial, Poisson and normal distribution - Simple problems (proof of the theorems not necessary).



## UNIT – IV SAMPLING DISTRIBUTION AND TEST OF SIGNIFICANCE:

Concepts of sampling, Testing of hypothesis, errors in hypothesis testing, standard error and sampling distribution, sampling of variables (large samples and small samples.). Student's "t" distribution and its applications. Chi-square test and goodness of fit. Analysis of variance - one way and two way classification. Duncan's Multiple Range test. Student's t test, ANOVA: Comparison of means in one or two groups (student's t-test). Comparison of means in three or more groups (ANOVA), F- test.

## UNIT – V DATA REPRESENTATION & ANALYSIS:

Design of experiment- Completely randomized block design, Randomized block design. Histogram, Stem-&-Leaf Plot, Line Diagram, Frequency Polygon, Frequency Curve, Pie Diagram, Bar Diagrams, Scatter Diagram, Box-&-Whisker Plot, Bubble Plot, Growth chart, Dendrogram, Nomogram, Partogram, Pedigree Chart, Cartogram.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

**Practice problems:** Describing Data, The Normal Distribution, Sampling Distributions, Confidence Intervals, Hypothesis Testing, Proportions, Linear Regression, Survival Analysis.

## COURSE OUTCOME:

1. Students will able to describe various application area of biostatistics
2. Will able to distinguish different types of data and sampling techniques
3. To calculate and interpret measures of central tendency and variability in statistical data
4. Will able to compute and interpret the result of correlation and regression analysis
5. To compare different population sample using ANOVA.



## BIOSTATISTICS

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCE1A:1</b>	3	3	-	2	2
<b>P22BCCE1A:2</b>	2	-	3	2	3
<b>P22BCCE1A:3</b>	2	1	2	2	3
<b>P22BCCE1A:4</b>	2	2	3	3	3
<b>P22BCCE1A:5</b>	-	3	2	-	3
<b>Optimum point</b>	3	3	3	3	3





## VALUE ADDED COURSE I

### Semester I

#### DETECTION METHODS OF FOOD ADULTERATION

Code: P22BCVAC1

(Theory)

Credit: 2\*

#### COURSE OBJECTIVES:

- To exemplify different food adulterants
- To elucidate the adulterants in food products

#### UNIT – I TESTING ADULTERATION OF MILK:

Test A: Adulteration of Milk Physical Tests: Detergent Test Filter Test Flow. Test B: Chemical Tests: Clot on boiling test. Test for starch in Milk Test for cane sugar in Milk Test for Buffaloes Milk in Cow's Milk Test for added colors in Milk Test for skim milk powder in milk Detects the presence of added carbonates and bicarbonates in milk Test for soda in milk. Test for glucose.

#### UNIT – II ADULTERATION OF GHEE:

Test for vegetable fat: Nitric acid test Soda ash test Valenta test Test for added alkali. Baudouin test. Analysis of butter: Test for Dalda in butter. Adulteration of Khoa: Test for starch in Khoa. Adulteration of Paneer: Presence of starch in paneer.

#### UNIT – III TESTING ADULTERATION OF OILS:

Test for sesame oil in other oils Halphen test for cottonseed oil Hexa bromide test for linseed oil Test for added mineral oil Test for added castor oil Detection of argemone oil in other oils Test for rancidity in oils Kries test for testing quality of oil.

#### UNIT – IV TESTING ADULTERATION OF SPICES:

Extraction of flavor. Coriander powder: Test for starch & horse dung power. Chili powder. Test for oil soluble dyes, powdered bran, saw dust and brick powder. Turmeric Powder: Test for metanil yellow and lead chromate polish. Cloves: Test for exhausted cloves. Curry powder: Test



for metallic colors.

## **UNIT – V TESTING ADULTERATION IN SEEDS:**

Poppy seeds: Test for Amaranthus seeds. Sajeera: Test for sand, stones and other seeds. Mustard seeds: Visual examination. Pepper: Test for papaya seeds. Saffron: Detection of maize cob tendrils. Cumin seeds; Cinnamon: plant bark.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Visit to the Food processing and analyzing lab. Food and adulteration awareness campaign – know your food quality

## **COURSE OUTCOMES:**

After successful completion of the course, students will be able to:

1. Understand the adulteration of common foods like milk and their adverse impact on health
2. Understand the adulteration of common foods like oil and their adverse impact on health
3. Understand the adulteration of common foods like milk and their adverse impact on health
4. Comprehend certain skills of detecting adulteration of spices and seeds
5. Be able to extend their knowledge to other kinds of adulteration, detection and remedies.





## DETECTION METHODS OF FOOD ADULTERATION

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCVAC1: 1</b>	-	3	2	3	3
<b>P22BCVAC1: 2</b>	-	3	1	3	2
<b>P22BCVAC1: 3</b>	-	3	1	3	2
<b>P22BCVAC1: 4</b>	3	3	1	2	2
<b>P22BCVAC1: 5</b>	3	2	3	3	3
<b>Optimum Point</b>	3	3	1	3	2



First Year

CORE COURSE III

Semester II

## BIOPHYSICAL CHEMISTRY

Code: P22BCCC21

(Theory)

Credit: 5

### COURSE OBJECTIVES:

- This course will introduce physical techniques commonly used for macromolecular characterization. An emphasis will be placed on the physical principles that underlie each technique.

### UNIT - I THERMODYNAMICS:

Thermodynamics - explanation of terms - types of systems - Zeroth law of thermodynamic - concept of heat and work - First law of thermodynamics - internal energy - enthalpy or heat content - Joule's Law - Joule - Thompson effect

- inversion temperature and its significance - Second law of thermodynamics - need for the II law - Carnot's cycle - efficiency - carnot's theorem (statement only)

- concept of entropy - entropy of an ideal gas - entropy changes in reversible and irreversible processes - Gibbs free energy - Helmholtz free energy - Gibbs & Helmholtz equations - Third Law of Thermodynamics - Nernst heat theorem - absolute entropy.

### UNIT - II SOLUTIONS:

Solutions: ideal and non-ideal - Raoult's law, Henry's law - Nernst distribution law and its applications - Colligative properties - lowering of vapor pressure, elevation of boiling point, depression of freezing point and osmotic pressure - thermodynamics of ideal solutions.

### UNIT - III ELECTROCHEMISTRY:

Electrochemical cells - cell e.m.f. - electrode potential - standard e.m.f. of the cell



- Nernst equation - single electrode potentials and cell e.m.f. measurement of single electrode potential - types of electrodes - reference electrodes - standard electrode potential - electrochemical series - Types of electrochemical cells: Chemicals cells - liquid junction potential - salt bridge - Concentration cells - definition - types of concentration cells - examples - e.m.f. of electrolyte concentration cells - applications of e.m.f measurements.

## UNIT – IV COLLOIDS:

Colloids: lyophobic and lyophilic colloids - Origin of charge and stability of lyophobic colloids - Coagulation and Schultz-Hardy rule - Zeta potential and Stern double layer 20 (qualitative idea) - Tyndall effect - Electro kinetic phenomenon (qualitative idea only) - Application of colloids Introduction, Self Assembly - Materials and molecules - Self Assembled Monolayers (SAM) - Nano materials: Techniques used in nanochemistry - Types of nanoparticles, Gold, Silver.

## UNIT – V SPECTROSCOPY:

Spectroscopy – general introduction - electromagnetic radiation and different regions - absorption spectroscopy - molecular spectra - types of molecular spectra - Vibrational spectra - IR spectra of diatomic molecules - Hooke's law - simple harmonic oscillator force constant - - anharmonic oscillator - applications - force constant determination - vibrational spectra of H<sub>2</sub>O and CO<sub>2</sub>.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

**Study of molecules in crystals, in solution, in cells, and in organisms. Discuss on the electronic structure, size, shape, dynamics, polarity, and modes of interaction of biological molecules.**

## COURSE OUTCOME:

- To know and understand how living organisms acquire and transform energy in order to perform biological work.
- Able to understand thermodynamics of ideal solutions.



- To understand how enzyme catalysis increases reaction rates without altering the chemical equilibrium.
- To become familiar with Langmuir theory, BET theory and their uses, Zeta potential Electro kinetic phenomenon, Donnan equilibrium, Primary and Secondary salt effects.
- To know the latest techniques which are nowadays used in determining the fast reactions.

## BIOPHYSICAL CHEMISTRY

### CO - PO matrices of course

– K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC21:1</b>	3	3	2	3	3
<b>P22BCCC21:2</b>	2	2	-	3	2
<b>P22BCCC21:3</b>	3	3	2	2	3
<b>P22BCCC21:4</b>	3	-	2	3	2
<b>P22BCCC21:5</b>	3	3	2	-	3
<b>Optimum Point</b>	3	3	2	3	3





**First Year**

**Semester II**

## **CORE COURSE IV**

### **ENZYMOLGY**

**Code: P22BCCC22**

**(Theory)**

**Credit: 5**

#### **COURSE OBJECTIVES:**

- Students will obtain basic knowledge about the relationship between properties and structure of the enzymes, their mechanism of action and kinetics of enzymatic reactions.
- Students can understand to compare and contrast the historical uses of enzyme technology with current applications in a diverse range of industries.

#### **UNIT – I INTRODUCTION OF ENZYMES:**

Definitions (catalytic power, specificity, reactivity, regulation, Holoenzyme, Apoenzyme, coenzymes and cofactors). Enzyme Nomenclature and IUB system of enzyme classification. Active site- Fisher and Koshland models. Formation of enzyme substrate complex evidence. Basic concepts of bioenergetics: The collision theory, activation energy and transition state theory. Measurement and expression of enzyme activity – enzyme assays, Enzyme units.

#### **UNIT – II ENZYME KINETICS:**

Pre-Steady state and Steady state kinetics,. Kinetics of single substrate enzyme catalyzed reaction - Michaelis-Menten (Briggs- Haldane) equation, Double- Reciprocal Plot, Lineweaver Burk plot, and Eadie-Hofstee plot. Determination of  $V_{max}$ ,  $K_m$ ,  $K_{cat}$ , Specificity constant ( $K_{cat}/K_m$ ) and their significance. Factors influencing enzymatic activity. Kinetics of enzyme reactions having two or more substrates. Single displacement and double displacement reactions.



## **UNIT – III MECHANISM OF ENZYME ACTION AND ENZYME INHIBITION:**

Mechanism of enzyme action: Factors contributing to the catalytic efficiency - proximity and orientation, covalent catalysis, acid-base catalysis, metal ion catalysis, strain and distortion theory. Mechanism of action of Lysozyme, Carboxypeptidase, Chymotrypsin and Ribonuclease. Reversible and Irreversible inhibition - Competitive, Non-competitive and mixed inhibition. Substrate inhibition and Feedback inhibition. Therapeutic, diagnostic and industrial applications of enzyme inhibitors.

## **UNIT – IV INTRODUCTION OF CO-ENZYMES:**

Structure and functions – Pyridine and flavin nucleotides, coenzyme A, Pyridoxal phosphate and thiamine pyrophosphate, tetrahydrofolate and B12 Coenzymes. Allosteric Interactions: Enzyme regulation, allosteric enzymes. Allosteric kinetics (MWC and KNF models), symmetry and sequential models. Hill's equation and Hill's coefficient. Isozymes.

## **UNIT – V MULTIENZYME SYSTEM:**

Multifunctional enzymes. Multi-enzyme complexes (Pyruvate dehydrogenase complex, fatty acid synthase and Na - K ATPase), Metalloenzymes. Modern concepts of evolution of catalysts: Catalytic RNA (Ribozymes), abzymes. Immobilized enzymes and their industrial applications. Chemical modification and site-directed mutagenesis of enzymes. Industrial applications of enzymes - food and pharmaceutical enzymes. Biosensors.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent advancement in enzyme technology and its applications. Influence of covid-19 infections on the level of enzymes.



## COURSE OUTCOME:

- The student was able to analyze the structure/function relationships in bio catalyzed reactions.
- Students are able to research a contemporary application of enzyme technology or metabolic engineering and present the results in a well- structured oral presentation.
- At the end of the course students will be explored to understand the use of enzymes in medicine, food, organic synthesis, genetics and other areas that favor a wide reach for them.
- Able to explain the coenzyme catalyzed reactions
- Able to understand the actions of multienzyme complex and industrial applications of enzymes.

## ENZYMOLGY

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC22:1</b>	3	3	-	-	3
<b>P22BCCC22:2</b>	3	3	2	-	3
<b>P22BCCC22:3</b>	3	3	-	2	3
<b>P22BCCC22:4</b>	3	3	-	-	3
<b>P22BCCC22:5</b>	3	3	-	-	3
<b>Optimum Point</b>	3	3	2	2	3





First Year

CORE CHOICE COURSE II

Semester II

## 1) GENETICS

Code: P22BCCC2A

(Theory)

Credit: 5

### COURSE OBJECTIVES:

- Identify and describe the process and purposes of the cell cycle, meiosis, and mitosis, as well as predict the outcomes of these processes.
- Transmission genetics problems, make accurate predictions about inheritance of genetic traits, and map the locations of genes
- To identify the parts, structure, and dimensions of DNA molecules, RNA molecules, and chromosomes, and be able to categorize DNA as well as describe how DNA is stored
- To describe what causes and consequences of DNA sequence changes and how cells prevent these changes, as well as make predictions about the causes and effects of changes in DNA
- To describe applications and techniques of modern genetic technology, as well as select the correct techniques to solve practical genetic problems

### UNIT – I INTRODUCTION TO GENETICS:

Brief history/basic concepts of genetics. Mendelian genetics/monohybrid, dihybrid cross. Mendelian genetics/trihybrid cross, probability. Modification of Mendelian ratios/incomplete and codominance. Modification of Mendelian ratios/incomplete and codominance. Structure of Gene - Interaction of Gene - Complementary Factors, Supplementary Factors, Inhibitory and Lethal Factors - Atavism. (<https://www.slideshare.net/vanessaceline/introduction-to-genetics>)

### UNIT – II CHROMOSOME ABNORMALITIES:

Diploid chromosomes number- Sex differentiation and sex determination. The X chromosomes, Barr bodies, the Lyon hypothesis. Aneuploidy and polyploidy: Gene deletion, duplication, inversions and translocation. Sex Linkage in Drosophila and Man, Sex Influenced and Sex Limited Genes - Non-Disjunction and Gynandromorphs - Cytoplasmic Inheritance - Maternal





Effect On Limnaea (Shell Coiling), Male Sterility (Rode's Experiment).CO<sub>2</sub> sensitivity In Drosophila, Kappa particles in Paramecium, Milk Factor in Mice.

## **UNIT – III BLOOD GROUPS AND CROSSING OVER:**

Blood Groups and their Inheritance in Human - Linkage and Crossing Over:- Drosophila - Morgans' Experiments - Complete and Incomplete Linkage, Linkage Groups, Crossing Over types, Mechanisms - Cytological Evidence for Crossing Over, Mapping of Chromosomes - Interference and Coincidence.

## **UNIT – IV NATURE AND FUNCTION OF GENETIC MATERIAL:**

Fine Structure of the Gene - Cistron, Recon, Muton - Mutation - Molecular Basis of Mutation, Types of Mutation, Mutagens, Mutable and Mutator Genes. Chromosomal Aberrations - Numerical and Structural Examples from Humans.U

## **UNIT – V APPLIED GENETICS:**

Animal Breeding - Heterosis, Inbreeding, OutBreeding, OutCrossing, Hybrid Vigor. Population Genetics, Evolutionary genetics, Hardy Weinberg Law - Gene Frequency, Factors Affecting Gene Frequency, Eugenics, Bioethics. ([www.goldiesroom.org/...](http://www.goldiesroom.org/...))

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

**Practice problems:** Genetic Principles and their application in medical practice; Case studies (Interacting with patients, learning family history and drawing pedigree chart); Syndromes and disorders: definition and their genetic basis - Cystic fibrosis and Tay Sachs Syndrome; Phenylketonuria and Galactosemia; Ethical issues with clinical genetics.



## COURSE OUTCOMES:

1. Identify and describe the process and purposes of the cell cycle, meiosis, and mitosis, as well as predict the outcomes of these processes. Transmission genetics problems, make accurate predictions about inheritance of genetic traits, and map the locations of genes.
2. To identify the parts, structure, and dimensions of DNA molecules, RNA molecules, and chromosomes, and be able to categorize DNA as well as describe how DNA is stored.
3. To describe what causes and consequences of DNA sequence changes and how cells prevent these changes, as well as make predictions about the causes and effects of changes in DNA. To describe applications and techniques of modern genetic technology, as well as select the correct techniques to solve practical genetic problems.
4. To carry out genetics laboratory and field research techniques.  
To describe experimental results in written format both informally and in formal manuscript format.
5. To accurately diagram and describe the processes of replication, transcription, translation, as well as predict the outcomes of these processes.

## GENETICS

### CO - PO matrices of course

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC2A:1</b>	3	3	-	-	3
<b>P22BCCC2A:2</b>	3	3	-	-	3
<b>P22BCCC2A:3</b>	3	3	2	-	3
<b>P22BCCC2A:4</b>	3	3	2	-	3
<b>P22BCCC2A:5</b>	3	3	-	-	3
<b>Optimum Point</b>	3	3	2	-	3





## CORE CHOICE COURSE II

Semester II

First Year

### 2) ENDOCRINOLOGY

Code: P22BCCC2B

(Theory)

Credit: 5

#### COURSE OBJECTIVES:

- Study the molecular mechanisms of hormone and growth factors action.

#### UNIT – I BASICS OF ENDOCRINE SYSTEM:

Definition and scope of Endocrinology - Anatomical aspects of mammalian endocrine system. Definition of a hormone- chemical nature of mammalian hormones- types of hormone receptors- secondary messenger system general mechanism of peptide and non- peptide hormones action.

#### UNIT – II ENDOCRINES OF HYPOTHALAMUS AND THYROID GLAND:

The Endocrines of Hypothalamus - Neurovascular hypothesis. Somatostatin. Pituitary gland hormones- chemistry and biochemical functions. Thyroid gland hormones- chemistry- biochemical functions- mechanism of action. Parathyroid glands- biochemical functions. Hormones involving in calcium metabolism- chemistry- mechanism of action.

#### UNIT – III HORMONES OF ADRENAL AND PANCREAS:

Adrenal gland: Hormones of adrenal gland- chemistry- mechanism of action biochemical functions. Pancreas- Insulin/glucagon: chemistry- biochemical functions- mechanism of action. Neuro-hormones- the brain-renin-angiotensin.

#### UNIT – IV HORMONES OF FEMALE AND MALE REPRODUCTIVE SYSTEM:

Hormones of female and male reproductive system: Ovarian steroid hormones chemistry- biosynthesis and transport; Synthesis, chemistry and metabolism of androgens - and



metabolism mechanisms of action of sex steroid hormones. Testicular and ovarian determining genes – Mullerian-inhibiting substance genes- molecular basis of male and female contraception.

## **UNIT – V            ENDOCRINOPATHIES:**

Endocrinopathies: Hypo-physeal, Thyroid, parathyroid, adrenal and pancreas. Disorders of pituitary hormone axis- thyrotoxicosis- hypothyroidism- Hashimoto's thyroiditis- metabolic bone diseases- Cushing syndrome- Addison's diseases Diabetes mellitus, androgen deficiency syndromes, Testicular neoplasm: Klinefelter's syndrome and Turner's syndrome.

## **UNIT – VI            CURRENT            CONTOURS            (For            Continuous Internal            Assessment Only):**

Discussion on recent research in key human endocrine disorders.



## COURSE OUTCOMES:

- Students will be able to identify the organs involved in endocrine function, will know the major hormones that are produced by these organs and will know the physiological effect of these hormones.
- Students will be able to understand key human endocrine disorders of thyroid
- Students will be able to understand key human endocrine disorders of pancreas
- Students will be able to understand key human endocrine disorders of adrenal
- Students will be able to understand key human endocrine disorders reproductive hormones

## ENDOCRINOLOGY

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC2B:1</b>	3	2	1	-	3
<b>P22BCCC2B:2</b>	3	2	1	-	3
<b>P22BCCC2B:3</b>	3	2	1	-	3
<b>P22BCCC2B:4</b>	3	2	1	-	3
<b>P22BCCC2B:5</b>	3	2	1	-	3
<b>Optimum point</b>	3	2	1	-	3





**First Year**

**CORE PRACTICAL II**

**Semester II**

## **MOLECULAR AND MICROBIAL TECHNIQUES**

**Code: P22BCCC2P**

**(Practical)**

**Credit: 3**

### **COURSE OBJECTIVES:**

- To introduce students to various practical aspects of Molecular biology.

### **EXPERIMENTS:**

1. Isolation of plasmid & Genomic DNA
  2. Estimation of DNA by diphenylamine method
  3. Estimation of RNA by orcinol method
  4. Separation of DNA by Agarose Gel Electrophoresis
  5. Purification of enzyme by ammonium sulphate precipitation Microbial Techniques
  6. Staining technique - Gram's staining
  7. Determination of bacterial growth curve
  8. Media preparation and Culture techniques - pour plate, spread plate and streak plate method
  9. Antibiotic Resistance
  10. Biochemical Characterization of Bacteria
- 
1. Indole test
  2. Methyl Red test
  3. Triple Sugar Iron Agar test
  4. Voges Proskauer test
  5. Citrate Utilization test
  6. Catalase test
  7. Urease test
  8. Oxidase test
  9. Nitrate test



## COURSE OUTCOME

1. Students able to Isolation of plasmid & Genomic DNA
2. Students able to Estimate DNA, RNA.
3. Students able to DNA isolation by electrophoresis
4. Media preparation and Culture techniques
5. Characterization of bacteria

## MOLECULAR AND MICROBIAL TECHNIQUES

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC2P:1</b>	3	2	2	2	3
<b>P22BCCC2P:2</b>	3	2	2	2	3
<b>P22BCCC2P:3</b>	3	2	2	2	3
<b>P22BCCC2P:4</b>	3	2	2	2	3
<b>P22BCCC2P:5</b>	3	2	2	2	3
<b>Optimum Point</b>	3	2	2	2	3





**First Year**

**Semester II**

## **ELECTIVE COURSE II**

### **1) BIOINFORMATICS**

**Code: P22BCE2A**

**(Theory)**

**Credit: 4**

#### **COURSE OBJECTIVES:**

- The purpose of studying this paper is to apply computational facilities in different fields of life sciences, physical and chemical sciences.
- After completion, students could learn drug designing through computer based modification programs using synthetic or natural sources.
- Most important application of Bioinformatics is in the field of drug discovery where it reduces more than 60% of the time, money and labor.

#### **UNIT – I      BIOINFORMATICS:**

An overview, Definition & History; Bioinformatics databases & tools on the Internet- NCBI, EBI, PIR, Swiss-Prot, GenBank ; pattern and motif searches- BLOCKS, PRINTS, PFAM

#### **UNIT – II    PROTEINS AMINO ACIDS:**

Levels of protein structure – Ramachandran Plot. Protein Secondary structure prediction - Chou-Fasman rules, Gamier-Osguthorpe-Robson (GOR) methods; Predicting 3D structure – homology modeling, threading - fold recognition and ab initio methods -- Rosetta – CASP.

#### **UNIT – III    BIOLOGICAL SEQUENCE ANALYSIS:**

Pairwise sequence comparison – Sequence queries against biological databases – BLAST and FASTA - Multiple sequence alignments –Phylogenetic alignment.

Algorithms and Matrices: Scoring matrices- PAM and BLOSUM; dynamic programming Algorithms, Needleman and Wunsch, Smith-Waterman;





## **UNIT – IV PROTEIN STRUCTURE VISUALIZATION TOOLS:**

Ras Mol, HEX, Argus Lab Swiss PDB Viewer - Structure –Classification, alignment and analysis  
– SCOP, CATH, FSSP, UNIX.

## **UNIT – V FUNCTIONAL GENOMICS (METABOLISM AND REGULATION) IN BIOCHEMISTRY:**

Sequencing genomes– Genome databases on the web, Prokaryotic Genome Database with comparison with Human genome, HGP, GENE CLUSTER, DNA Microarray, SWISS-2DPAGE Database, TIGR, WIT, CYTOSCAPE and DRUG DISCOVERY.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

**Model Predictions:** Using Bioinformatics tools to predict protein models in disease related pathways.

### **COURSE OUTCOME:**

1. To get introduced to the basic concepts of Bioinformatics and its significance in Biological data analysis.
2. Explain about the methods to characterize and manage the different types of Biological data.
3. Introduction to the basics of sequence alignment and analysis.
4. Able to explain the protein visualization tools
5. Able to explain the functional genomics



## BIOINFORMATICS

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCE2A:1</b>	2	1	2	1	3
<b>P22BCE2A:2</b>	2	-	-	2	2
<b>P22BCE2A:3</b>	1	2	-	2	2
<b>P22BCE2A:4</b>	2	1	3	2	2
<b>P22BCE2A:5</b>	3	3	-	2	2
<b>Optimum Point</b>	2	2	3	2	2





First Year

ELECTIVE COURSE II

Semester II

## 2) GENOMICS AND PROTEOMICS

Code: P22BCE2B

(Theory)

Credit: 4

### COURSE OBJECTIVES:

- The objective of this course is to provide introductory knowledge concerning genomics, proteomics and their applications.

### UNIT – I BASICS OF GENOMICS AND PROTEOMICS:

Brief overview of prokaryotic and eukaryotic genome organization; extra- chromosomal DNA: bacterial plasmids, mitochondria and chloroplast.

### UNIT – II GENOME MAPPING:

Genetic and physical maps; markers for genetic mapping; methods and techniques used for gene mapping, physical mapping, linkage analysis, cytogenetic techniques, FISH technique in gene mapping, somatic cell hybridization, radiation hybrid maps, *in situ* hybridization, comparative gene mapping.

### UNIT – III GENOME SEQUENCING PROJECTS:

Human Genome Project, genome sequencing projects for microbes, plants and animals, accessing and retrieving genome project information from the web.

### UNIT – IV COMPARATIVE GENOMICS:

Identification and classification of organisms using molecular markers- 16S rRNA typing/sequencing, SNPs; use of genomes to understand evolution of eukaryotes, track emerging diseases and design new drugs; determining gene location in genome sequence.



## **UNIT – V      PROTEOMICS:**

Aims, strategies and challenges in proteomics; proteomics technologies: 2D- PAGE, isoelectric focusing, mass spectrometry, MALDI-TOF, yeast 2-hybrid system, proteome databases.

## **UNIT – VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):**

**Functional genomics and proteomics:** Transcriptome analysis for identification and functional annotation of gene, Contig assembly, chromosome walking and characterization of chromosomes, mining functional genes in genome, gene function- forward and reverse genetics, gene ethics; protein-protein and protein- DNA interactions; protein chips and functional proteomics; clinical and biomedical applications of proteomics; introduction to metabolomics, lipidomics, metagenomics and systems biology.

## **COURSE OUTCOMES:**

1. Students should be able to acquire knowledge and understanding of fundamentals of genomics and proteomics
2. Students should be able to acquire knowledge and understanding of genome mapping
3. Able to explain Genome sequencing process
4. Able to describe Designing of new drugs
5. Able to understand the practical techniques of proteomics



## GENOMICS AND PROTEOMICS

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCE2B:1</b>	2	2	1	1	2
<b>P22BCE2B:2</b>	2	1	3	1	2
<b>P22BCE2B:3</b>	2	1	1	1	2
<b>P22BCE2B:4</b>	3	3	2	2	3
<b>P22BCE2B:5</b>	1	2	2	1	3
<b>Optimum point</b>	2	2	2	1	2





**First Year**

**Semester II**

## **NON-MAJORE ELECTIVE COURSE I**

### **CLINICAL BIOCHEMISTRY**

**Code: P22BCNME1**

**(Theory)**

**Credit: 2**

#### **COURSE OBJECTIVES:**

- To impart thorough knowledge about the biochemical basis of various diseases and disorders.
- To study various diagnostic and therapeutic methodologies available for diseases and disorders.

#### **UNIT – I      BIOCHEMICAL LABORATORY - ROUTINE ANALYSIS IN URINE AND BLOOD:**

Introduction to Biochemical laboratory: Roles of biochemical laboratory, Mechanization and automation in clinical biochemistry. Quality control in clinical laboratories - Total laboratory uncertainty, accuracy and precision. Selection and optimization of laboratory methods. Clinical evaluation of laboratory methods.

Biochemical analysis in blood and urine. Analysis of proteins - Plasma protein spectrum during inflammation, paraproteins. Blood gasses. Electrolytes and acid – base balance. Regulation of electrolyte content of body fluids and maintenance of pH reabsorption of electrolytes. Acidosis & Alkaloids and their determination in the clinical laboratory.

#### **UNIT – II      DISORDERS OF CARBOHYDRATE AND PROTEIN METABOLISM:**

Disorders of carbohydrate metabolism- Glucose level in normal blood, renal threshold, hyper and hypoglycemia and glycosuria - qualitative tests for sugars in urine - intravenous and other types of glucose tolerance tests - fructose levels in blood, lab diagnosis of early and latent



diabetes mellitus - diabetic coma, secondary degenerative changes associated with diabetes mellitus. Glycogen storage disorders, Pentosuria, and galactosemia.

### **UNIT – III      DISORDER OF PROTEIN METABOLISM:**

Agammaglobulinemia, Alpha – fetoprotein, Amyloidosis. Cryoglobulinemia. Hypo and hyper immune gamma – globulinemia. Abnormalities in Nitrogen Metabolism – uremia and factors affecting nitrogen balance, porphyrias and porphyrinuria.

### **UNIT – IV      DISORDERS OF LIPIDS AND INBORN ERRORS OF METABOLISM:**

Disorders of lipids: Plasma lipoproteins, cholesterol, triglycerides & phospholipids in health and disease. Hyperlipidemia, hyperlipoproteinemia, ketone bodies, fatty liver. Major Cardiovascular diseases – Atherosclerosis – risk factors, pathogenesis. Laboratory diagnosis of acute myocardial infarction. Inborn error of metabolism: Phenylketonuria, alkaptonuria, albinism, tyrosinosis, maple syrup urine disease, Leish – Nyhan syndrome, Histidinemia, Gaucher's disease, Tay – Sachs and Niemann – Pick disease.

### **UNIT – V      DISORDERS OF LIVER AND KIDNEY:**

Hepatobiliary system - Hepatobiliary function tests - lab findings and differential diagnosis of jaundice - metabolism of bilirubin - cirrhosis, hepatic coma, hepatitis, gallstones, cholecystitis and tumors. Diagnostic Enzymes – Enzymes in health and diseases. Excretory system - Renal function tests - Biochemical changes and laboratory findings in acute and chronic renal failure - clearance of tests - urinary calculi, renal hypertension - principles of peritoneal and hemodialysis. Blood and coagulation - disturbances of blood clotting mechanisms - systematic analysis of hemorrhagic disorders - coagulation and prothrombin time, determination - haemoglobin-anemia - abnormal hemoglobins and their identification.

### **UNIT – VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):**

**Diagnosis:** Laboratory diagnosis and investigations related to disorders of thyroid, pituitary, adrenal cortex, adrenal medulla, testes, ovaries - plasma and urinary assays of hormones related to various endocrine disorders.



## **COURSE OUTCOMES:**

1. The students will understand the basic concepts and principles of various diseases, and on the various biological specimens including the process of collection, preservation and storage.
2. The students will understand the etiology, types, clinical manifestations and treatment of various metabolic disorders of carbohydrate, protein and lipids.
3. The students will understand the pathophysiological processes responsible for common inherited disorders.
4. Able to understand inborn disorders of metabolism
5. Able to explain the symptoms, Diagnosis of liver disease





## CLINICAL BIOCHEMISTRY

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCNME1:1</b>	3	3	2	3	3
<b>P22BCNME1:2</b>	3	2	3	2	2
<b>P22BCNME1:3</b>	3	2	3	3	2
<b>P22BCNME1:4</b>	3	3	3	3	3
<b>P22BCNME15</b>	3	3	2	3	3
<b>Optimum Point</b>	3	3	3	3	3

*(Faint signature or stamp)*



**Second Year**

**CORE COURSE V**

**Semester III**

## **METABOLISM AND REGULATION**

**Code: P22BCC31**

**(Theory)**

**Credit: 5**

### **COURSE OBJECTIVES:**

- . To learn the metabolism and integration of biomolecules that takes place in the human system.
- a. Integrate the various aspects of metabolism & their regulatory pathways.
- b. Students can understand the fundamental energetic of biochemical processes.
- c. To elaborate the relation between biochemical defects and metabolic disorders.
- d. To follow the organization of signaling pathways.

### **UNIT - I INTRODUCTION:**

Overview of major classes of biomolecules, forces stabilizing biomolecules. General scheme of metabolism, historical and experimental details in derivation of a metabolic pathway, catabolic, anabolic and amphibolic pathways. Oxidative phosphorylation. Electron transport chain. Standard free energy change of a chemical reaction, redox potentials, ATP and high energy phosphate compounds.

### **UNIT - II CARBOHYDRATES METABOLISM:**

Glycolysis and gluconeogenesis – pathway, key enzymes and co-ordinate regulation. The citric acid cycle and its regulation. The pentose phosphate pathway. Metabolism of glycogen and regulation. Key junctions in metabolism– glucose-6-phosphate, pyruvate and acetyl CoA. Blood glucose homeostasis– role of tissues and hormones.

### **UNIT - III AMINO ACID METABOLISM:**

Biosynthesis and degradation of amino acids and their regulation. Transamination and deamination, ammonia formation, the urea cycle and regulation of ureogenesis.



## **UNIT – IV LIPIDS METABOLISM:**

Lipogenesis: biosynthesis of fatty acid, triglycerides, phospholipids, and cholesterol. Regulation of triacylglycerol, phospholipids and cholesterol biosynthesis. Oxidation of lipids. Role of carnitine cycle in the regulation of  $\beta$  - oxidation. Cholesterol Catabolism, Ketogenesis and its control. Lipoprotein metabolism - exogenous and endogenous pathways.

## **UNIT – V NUCLEIC ACID METABOLISM:**

Biosynthesis and catabolism of purines and pyrimidines and their regulation.  
(<https://www.slideshare.net/senchiy/nucleic-acids-and-nucleotide>)

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**Current aspects on metabolism: metabolic changes after covid-19 infections.

## **COURSE OUTCOMES:**

1. To learn the metabolism and integration of biomolecules that takes place in human system. Integrate the various aspects of metabolism & their regulatory pathways. Students can understand the fundamental energetics of biochemical processes
2. To understand the relation between biochemical defects and metabolic disorders.
3. To understand the organization of signaling pathways. To understand the role of membrane processes in metabolism
4. Overall, gaining an understanding of the processes of metabolic transformation at the molecular level and how these processes are studied.
5. Afford students opportunity to appreciate the relevance/applications of biochemistry in our daily activities.



## METABOLISM AND REGULATION

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC31:1</b>	3	1	2	-	2
<b>P22BCCC31:2</b>	3	1	2	-	2
<b>P22BCCC31:3</b>	3	2	2	-	2
<b>P22BCCC31:4</b>	3	2	2	-	2
<b>P22BCCC31:5</b>	3	2	2	-	2
<b>Optimum point</b>	3	2	2	-	2





**Second Year**

**CORE COURSE VI**

**Semester III**

## **CLINICAL BIOCHEMISTRY**

**Code: P22BCC32**

**(Theory)**

**Credit: 5**

### **COURSE OBJECTIVES:**

- The course aims to provide an advanced understanding of the biochemical mechanisms and pathophysiological processes responsible for common biochemical disorders.
- The course provides an overview of normal and abnormal metabolic functions, the impact of disorders on metabolic processes, an overall picture about the molecular basis of diseases and novel strategies to prevent the diseases

### **UNIT – I      BIOCHEMICAL LABORATORY - ROUTINE ANALYSIS IN URINE AND BLOOD:**

Introduction to Biochemical laboratory: Roles of biochemical laboratory, Mechanization and automation in clinical biochemistry. Quality control in clinical laboratories - Total laboratory uncertainty, accuracy and precision. Selection and optimization of laboratory methods. Analysis of proteins - Plasma protein spectrum during inflammation, paraproteins. Blood gases. Acidosis & **Alkalosis** and their determination in clinical laboratory

### **UNIT – II      DISORDERS OF CARBOHYDRATE METABOLISM:**

Disorders of carbohydrate metabolism- Glucose level in normal blood, renal threshold, hyper and hypoglycemia and glycosuria - intravenous and other types of glucose tolerance tests - fructose levels in blood, Diabetes mellitus-types, causes and symptoms-lab diagnosis of early and latent diabetes mellitus - diabetic coma, secondary degenerative changes associated with diabetes mellitus. Glycogen storage disorders, Pentosuria, and galactosemia.

### **UNIT – III      DISORDER OF PROTEIN AND LIPID METABOLISM:**

Agammaglobulinemia, Alpha – fetoprotein, Amyloidosis. Cryoglobulinemia. Hypo and hyper immune gamma – globulinemia. Abnormalities in Nitrogen Metabolism – uremia and factors affecting nitrogen balance, porphyrias and porphyrinuria. Disorders of lipids: Plasma lipoproteins, cholesterol, triglycerides & phospholipids in health and disease. Hyperlipidemia, hyperlipoproteinemia, ketone bodies, fatty liver. Major Cardiovascular diseases –



Atherosclerosis – risk factors, pathogenesis. Laboratory diagnosis of acute myocardial infarction. Inborn error of metabolism: Phenylketonuria, alkaptonuria, albinism, tyrosinosis, maple syrup urine disease, Lesch – Nyhan syndrome, Histidinemia, Gaucher's disease, Tay – sachs and Niemann – Pick disease.

## **UNIT – IV      DISORDERS OF LIVER AND KIDNEY:**

Hepatobiliary system - Hepatobiliary function tests - lab findings and differential diagnosis of jaundice - metabolism of bilirubin - cirrhosis, hepatic coma, hepatitis, gallstones, cholecystitis and tumors. Diagnostic Enzymes – Enzymes in health and diseases. Excretory system - Renal function tests - Biochemical changes and laboratory findings in acute and chronic renal failure - clearance of tests - urinary calculi, renal hypertension - principles of peritoneal and hemodialysis.

## **UNIT – V      DISORDERS OF ENDOCRINE SYSTEM:**

Blood and coagulation - disturbances of blood clotting mechanisms -hemophilia, systematic analysis of hemorrhagic disorders - coagulation and prothrombin time, determination - haemoglobin-anaemia - abnormal hemoglobins - thalassemia and sickle cell anemia. Endocrine system: Laboratory diagnosis and investigations related to disorders of thyroid, pituitary, adrenal cortex, adrenal medulla, testes, ovaries - plasma assays of hormones related to various endocrine disorders.

**UNIT – VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):** Seminar talks on recent research topics in diabetes and cardiovascular diseases.

### **COURSE OUTCOMES:**

1. The students will understand the basic concepts and principles of Clinical Biochemistry, detail on the various biological specimens including the process of collection, preservation and storage.
2. The students will understand the aetiology, types, clinical manifestations and treatment of various metabolic disorders of carbohydrate, protein and lipids.
3. The students will understand the pathophysiological processes responsible for common inherited disorders
4. Able to understand inborn disorders of metabolism
5. Able to explain the symptoms, Diagnosis of liver diseases



## CLINICAL BIOCHEMISTRY

### CO - P O matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-”

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC32:1</b>	2	2	3	3	2
<b>P22BCCC32:2</b>	2	3	3	3	2
<b>P22BCCC32:3</b>	1	1	2	2	3
<b>P22BCCC32:4</b>	2	2	1	2	2
<b>P22BCCC32:5</b>	1	1	1	-	2
<b>Optimum Point</b>	2	2	3	3	2





Second Year

CORE CHOICE COURSE III

Semester III

## 1. ECOLOGY AND ENVIRONMENTAL BIOLOGY

Code: P22BCCC3A

(Theory)

Credit: 5

### COURSE OBJECTIVES:

- To study the ecological factors, structure and function of the ecosystem.
- To study about biodiversity and natural resources in the Biosphere.
- To understand the causes, effects and control measures of pollution.

### UNIT – I ECOLOGY:

Definition, principle, branches and scope of ecology. Ecological factor: Abiotic – Physical and chemical factors: Soil, air, water, temperature, pH, humidity, radiation, wind, pressure, precipitation. Biotic – Limiting factors – Species interaction: Commensalism, amensalism, mutualism, competition, parasitism, prey-predator relationship. Basic components of an ecosystem – structure and functional aspects of an ECOSystem, Trophic structure – Ecological Niche.

### UNIT – II POPULATION:

Population: definition, characteristics, population density, natality, mortality, age distribution, growth patterns, population fluctuation, population equilibrium, biotic potentials, population dispersion and regulation of population. Ecological succession types, process, climax and significance of succession. Food chain – types of food chain with examples, food web, energy flow, ecological pyramid of biomass.

### UNIT – III ECOSYSTEM:

Definition, concept, structure and function of an ecosystem: producers, consumers and decomposers. Primary and secondary productivity. Ecosystem types: Terrestrial – forest, mountain, deserts and grassland. Aquatic – Freshwater (lentic and lotic) and marine (Estuary,





mangroves, corals, deep sea).

## **UNIT – IV      BIODIVERSITY:**

Definition, concept and types of biodiversity. Introduction to taxonomy. Biogeographical classification in India. Values of biodiversity. Status of biodiversity – Global, national and local status. Hot-spots of biodiversity. Endangered and threatened species. Strategies for biodiversity conservation – In- situ and Ex-situ conservation, Cryopreservation, Gene banks, Gene pool and species conservation. National parks and sanctuaries. Common flora and fauna in India. Bioprospecting.

## **UNIT – V      ENVIRONMENTAL SCIENCE:**

Definition, principle and scope of Environmental science. Earth, man and Environment interactions. Geographical classification and zones. Significance of Atmosphere, lithosphere and Hydrosphere. Biosphere – global distribution of plant biomes, spatial distribution of animals – zoogeographic realms. Environmental pollution: definition types (Air, water and soil). Biogeochemical Cycles.

**UNIT – VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):** Seminar talks on recent research topics in Ecology, Biodiversity and Environmental issues.

## **COURSE OUTCOMES:**

1. This course will provide an understanding of the major factors influencing the geographic distribution of species.
2. Be able to understand the ecological context in which a particular species may have evolved, or a specific ecological process takes place.
3. Able to explain the interactions of components of ecosystem
4. Able to understand the depth of biodiversity in an ecosystem
5. Able to understand the environmental issues



## ECOLOGY AND ENVIRONMENTAL BIOLOGY

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC3A:1</b>	3	2	3	2	3
<b>P22BCCC3A:2</b>	3	2	3	2	3
<b>P22BCCC3A:3</b>	3	2	3	2	3
<b>P22BCCC3A:4</b>	3	2	3	2	3
<b>P22BCCC3A:5</b>	3	2	3	2	3
<b>Optimum Point</b>	3	2	3	2	3





Second Year

CORE CHOICE COURSE III

Semester III

## 2. DEVELOPMENTAL BIOLOGY

Code: P22BCCC3B

(Theory)

Credit: 5

### COURSE OBJECTIVES:

- Understand the molecular and cellular mechanisms of development and learn about basic embryology.

### UNIT - I INTRODUCTION TO EVOLUTION:

Emergence of evolutionary thoughts: Lamarks; Darwin – concepts of variation, adaptation, struggle, fitness and natural selection; Mendelism; spontaneity of mutations; the evolutionary synthesis, Origin of cells and unicellular evolution; Origin of basic biological molecules; abiotic synthesis of organic monomers and polymers; concept of Oparin and Haldane; experiment of Miller (1953); the first cell; evolution of prokaryotes; origin of eukaryotic cells; evolution of unicellular eukaryotes; anaerobic metabolism, photosynthesis and aerobic metabolism.

### UNIT - II CONCEPTS OF DEVELOPMENT:

Basic concepts of development: Potency, commitment, specification, induction, competence, determination and differentiation; morphogenetic gradients; cell fate and cell lineages; stem cells; genomic equivalence and the cytoplasmic determinants; imprinting.

### UNIT - III FERTILIZATION IN ANIMALS AND PLANTS:

Gametogenesis, Fertilization and early development: Production of gametes, cell surface molecules in sperm-egg recognition in animals; embryo sac development and double fertilization in plants; zygote formation, cleavage, blastula formation, embryonic fields, gastrulation and formation of germ layers in animals; embryogenesis, establishment of symmetry in plants; seed formation and germination.



## **UNIT – IV DEVELOPMENT OF ANIMALS:**

Morphogenesis and organogenesis in animals: Cell aggregation and differentiation in Dictyostelium; axes and pattern formation in Drosophila, organogenesis – vulva formation in Caenorhabditis elegans; eye lens induction, limb development and regeneration in vertebrates; differentiation of neurons, post embryonic development- larval formation, metamorphosis; environmental regulation of normal development; sex determination.

## **UNIT – V DEVELOPMENT OF PLANTS:**

Morphogenesis and organogenesis in plants: Organization of shoot and root apical meristem; shoot and root development; leaf development and phyllotaxy; transition to flowering, floral development in Arabidopsis and Antirrhinum.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent advances in Developmental Biology. Short talk presenters and detailed discussion of original research articles in class.

## **COURSE OUTCOMES:**

Upon completion of this course, the students will be able to

1. To understand the basic concepts and theories related to developmental biology
2. Understand reproductive organs, gametogenesis and fertilization
3. Understand the concept of cell differentiation and gene action in development
4. Understand the concept of animal development
5. Understand the concept of plant development.



## DEVELOPMENTAL BIOLOGY

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC3B:1</b>	2	3	3	2	3
<b>P22BCCC3B:2</b>	2	3	3	2	3
<b>P22BCCC3B:3</b>	2	3	3	2	3
<b>P22BCCC3B:4</b>	2	3	3	2	3
<b>P22BCCC3B:5</b>	2	3	3	2	3
<b>Optimum Point</b>	2	3	3	2	3





**Second Year**

**CORE PRACTICAL III  
CLINICAL BIOCHEMISTRY**

**Semester III**

**Code: P22BCCC3P**

**(Practical)**

**Credit: 3**

### **COURSE OBJECTIVES:**

- To study the various diagnostic and therapeutic methodologies available for diseases and disorders.

### **EXPERIMENTS:**

#### **I - Hematological studies**

1. Blood Grouping and Rh typing.
2. Estimation of hemoglobin content.
3. Total RBC count.
4. Total WBC count.
5. Determination of clotting time
6. Total platelet count.
7. Determination of Prothrombin time
8. Determination of ESR.

#### **II - Biochemical analysis of urine & blood**

Collection, preservation (blood and urine)

1. Estimation of blood glucose
2. Estimation of serum total proteins and A: G ratio
3. Estimation of serum cholesterol
4. Estimation of blood and urine urea
5. Estimation of serum and urine calcium
6. Estimation of serum and urine uric acid
7. Estimation of serum bilirubin.
8. Estimation of serum creatinine
9. Estimation of serum AST / ALT
10. Estimation of serum acid phosphatase / alkaline phosphatase



### III - Urology

Urine- Qualitative tests of urine. Abnormal constituents - Reducing sugar- Benedict test, protein: -Heat and acetic acid test, and sulfosalicylic acid method, Ketone bodies-Rothera's test, Bile pigment (Fouchet method), bile salt (Hay's test), Urobilinogen-Ehrlich aldehyde test and Bence Jones protein test.

### IV Paper electrophoresis of serum proteins

#### COURSE OUTCOMES:

1. To learn about tests carried out for biochemical investigations.
2. Understanding of principle of biochemical Clinical biochemistry tests.
3. To learn normal ranges and abnormal ranges of biochemical components and hormones.
4. To study diseases related to biochemical and hormone imbalance in the human body.
5. To Afford students opportunity to appreciate the applications of biochemistry in medicine

### CLINICAL BIOCHEMISTRY PRACTICALS

#### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC3P:1</b>	2	2	1	2	1
<b>P22BCCC3P:2</b>	3	2	1	1	2
<b>P22BCCC3P:3</b>	2	1	3	2	2
<b>P22BCCC3P:4</b>	2	2	3	1	3
<b>P22BCCC3P:5</b>	1	2	3	2	3
<b>optimum Point</b>	2	2	3	2	2





**Second Year**

**ELECTIVE COURSE III**

**Semester III**

## **1. BIOETHICS AND IPR**

**Code: P22BCE3A**

**(Theory)**

**Credit: 4**

### **COURSE OBJECTIVES:**

- To discuss various aspects of biosafety regulations, IPR and bioethic concerns arising from the commercialization of biotech products.

### **UNIT - I BIOSAFETY AND RISK ASSESSMENT ISSUES:**

Regulatory framework; National biosafety policies and law, The Cartagena protocol on biosafety, WTO and other international agreements related to biosafety, Cross border movement of germplasm; Risk management issues - containment.

### **UNIT - II GENERAL PRINCIPLES FOR THE LABORATORY AND ENVIRONMENTAL BIOSAFETY:**

Health aspects; toxicology, allergenicity, antibiotic resistance, etc; Impact on environment: gene flow in natural and artificial ecologies; Sources of gene escape, tolerance of target organisms, creation of superweeds/superviruses, etc.

### **UNIT - III ECOLOGICAL ASPECTS OF GMOS AND IMPACT ON BIODIVERSITY:**

Monitoring strategies and methods for detecting transgenics; Radiation safety and non-isotopic procedure; Benefits of transgenics to human health, society and the environment.

### **UNIT - IV THE WTO AND OTHER INTERNATIONAL AGREEMENTS:**

Intellectual properties, copyrights, trademarks, trade secrets, patents, geographical indications, etc; Protection of plant variety and farmers right act; Indian patent act and amendments.

### **UNIT - V PATENT FILING; CONVENTION ON BIOLOGICAL DIVERSITY:**

Implications of intellectual property rights on the commercialization of biotechnology products.

### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Study the philosophical, social, and legal issues arising in medicine and the life sciences. Discuss the rights given to persons over the creations of their minds.

### **COURSE OUTCOMES:**

1. To help to address important questions emerging in practice and research in healthcare and biological sciences as well as other allied fields.
2. To recognize the importance of IP and to educate the pupils on basic concepts of Intellectual Property Rights.





3. To identify the significance of practice and procedure of Patents.
4. To provide knowledge about national and international laws concerning biotechnology and bioethical issues
5. To learn the procedure of obtaining Patents, Copyrights, Trade Marks & Industrial Design

## BIOETHICS AND IPR

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCE3A:1</b>	3	3	2	2	2
<b>P22BCE3A:2</b>	2	3	3	2	2
<b>P22BCE3A:3</b>	2	2	2	3	2
<b>P22BCE3A:4</b>	3	2	3	2	2
<b>P22BCE3A:5</b>	2	2	2	2	2
<b>Optimum point</b>	3	3	3	2	2





Second Year

ELECTIVE COURSE III

Semester III

## 2. PHARMACEUTICAL CHEMISTRY

Code: P22BCE3B

(Theory)

Credit: 4

### COURSE OBJECTIVES:

To enable the students

- Study the general metabolism of drugs.
- Evaluate their clinical importance and effects by bioassays.

### UNIT – I ABSORPTION, DISTRIBUTION AND METABOLISM OF DRUGS:

Sedatives, Analgesics, NSAIDS, Antidepressants, Anxiolytics, Anticonvulsants, Antihistamines, Local anesthetics, Cardiovascular drugs – Antianginal agents, Vasodilators, Adrenergic; cholinergic drugs, Cardiotonic agents, Diuretics, Antihypersensitive drugs, Hypoglycemic agents, Antilipemic agents, Coagulants, Anticoagulants, Antiplatelet agents. Chemotherapeutic agents – Antibiotics, Antibacterials, Sulphadiazine. Antiviral, Antitubercular, Antimalarial, Anticancer, Antiamoebic drugs. Diagnostic agents.

### UNIT – II BIOMEDICAL IMPORTANCE OF DRUGS:

Biochemical role of hormones, Vitamins, Enzymes, Nucleic acids, Bioenergetics. General principles of immunology. Immunological techniques. Adverse drug interaction. Preparation and storage and uses of official Radiopharmaceuticals.

### UNIT – III TOXICOLOGY:

Toxicology, drug interactions and pharmacology of drugs acting on the central nervous system, Cardiovascular system, Autonomic nervous system, Gastrointestinal system and Respiratory system. Hormones, Chemotherapeutic agents including anticancer drugs.

### UNIT – IV BIOPHARMACEUTICALS:

Development, manufacturing standards, labeling, packing as per the pharmacopoeial requirements, storage of different dosage forms and new drug delivery systems. Biopharmaceuticals and Pharmacokinetics and their importance in formulation.

### UNIT – V CHEMOTHERAPY OF MICROBIAL DISEASES:

Chemotherapy of microbial diseases: Urinary antiseptics, sulphonamides, penicillin, streptomycin, Tetracyclines and other antibiotics. Anti-tubercular agents, Antifungal agents, antiviral drugs, antiepileptic drugs. Chemotherapy of protozoal diseases, Anthelmintic drugs. Chemotherapy of cancer.



## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Seminar talks on recent research topics in Drug development and validation. REFERENCES:

1. Devin., "Text Book of Biochemistry with clinical correlation", 1992
2. Donald Voet., "Biochemistry", 2004
3. Harper's., "Illustrated Biochemistry", 2006
4. Alfred Burger., "A guide to chemical basis of drugs design", John Wiley & Sons.
5. Goodman and Gilman's., "The Pharmacological Basis of Therapeutics", 8 th edition Pergamon Press.
6. John Smith and Haywel Williams., "Introduction to the principles of drug design", Wright PSG.
7. Manfred E Wolff., "Burgers Medicinal chemistry – The basis of Medicinal Chemistry" Part – I. John Wiley & Sons.



## COURSE OUTCOMES:

- Students will be able to understand the basic concepts of bio-inorganic, bioorganic, physical chemistry, analytical chemistry, drug formulation, drug design and development, and green chemistry.
- Students will be able to demonstrate knowledge to develop Pharmaceutically important molecules, new drug delivery systems etc.
- Students will demonstrate an ability to analyze and interpret data of analytical experiments in production, quality control & assurance of pharmaceutical synthesis and formulation.
- Students will be able to apply analytical tools for determination of organic molecules.
- Students will be able to generate validation protocols for all pharmaceutical operations starting from drug research to development to formulation.
- Learn Role of drugs to inhibit the particular enzymes and treatment of disease. Learn Mode of action of different drugs.

## PHARMACEUTICAL CHEMISTRY

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCE3B:1</b>	3	3	2	3	3
<b>P22BCE3B:2</b>	3	3	2	3	3
<b>P22BCE3B:3</b>	3	3	2	3	3
<b>P22BCE3B:4</b>	3	3	2	3	3
<b>P22BCE3B:5</b>	3	3	2	3	3
<b>Optimum point</b>	3	3	2	3	3





Second Year

NON-MAJOR ELECTIVE II

Semester III

## BIOCHEMISTRY

Code: P22BCNME2

(Theory)

Credit: 2

### COURSE OBJECTIVES:

- To understand the structure and functions of important biological macromolecules.

#### UNIT - I CARBOHYDRATE:

Definition, classification, and biological significance of monosaccharide (glucose, fructose, ribose), Disaccharide (lactose, maltose & Sucrose), Polysaccharide – Homopolysaccharides (cellulose, starch and glycogen), Heteropolysaccharides (chondroitin sulphate, Heparin and hyaluronate).

#### UNIT - II AMINO ACIDS AND PROTEINS:

Classification, Physical properties. Peptide bond –Classification and biologically important peptides. Protein – Definition, classification. Biological functions and significance of proteins

#### UNIT - III NUCLEIC ACIDS:

Definition, Nucleoside; Nucleotide, functions of nucleotides Watson & Crick model of DNA structure, various forms and functions of DNA. Types, structure and functions of RNA (mRNA, tRNA, rRNA).

#### UNIT - IV LIPIDS AND PORPHYRINS:

Definition, Classification. Fatty acids - classification, Simple lipids –Triglycerides. Compound lipids: Structure and functions of phospholipids and glycolipids, Steroids – Structure and function of cholesterol. Structure of Porphyrins - Structure and function of Heme, Cytochromes and Chlorophyll.

#### UNIT - V VITAMINS AND MINERALS:

Definition, sources, functions, deficiency syndromes of Fat soluble vitamins (A, D, E and K) and Water soluble vitamins (B complex and C). Calcium, Phosphorus, Magnesium, Sodium, Potassium, Iron, Zinc, Iodine, Fluoride, Copper Selenium, Manganese and Chromium. Other trace elements: Molybdenum, boron, nickel, lithium, antimony, aluminium and lead.

#### UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Using the basic understanding of various biomolecules, identify its importance in drug



development, immunology, pathology, pharmacy, vaccine development, etc.

## COURSE OUTCOMES:

1. Students can understand the fundamental energetics of biochemical processes
2. To understand the relation between biochemical defects and metabolic disorders.
3. To understand the organization of signaling pathways.
4. To understand the role of membrane processes in metabolism
5. Overall, gaining an understanding of the processes of metabolic transformation at the molecular level and how these processes are studied.

## NME- BIOCHEMISTRY

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCNME2:1</b>	3	2	2	3	3
<b>P22BCNME2:2</b>	3	2	2	3	3
<b>P22BCNME2:3</b>	3	3	2	2	3
<b>P22BCNME2:4</b>	3	2	2	3	2
<b>P22BCNME2:5</b>	3	3	2	3	2
<b>Optimum point</b>	3	2	2	3	3





Second Year

CORE COURSE VII

Semester IV

## IMMUNOLOGY

Code: P22BCCC41

(Theory)

Credit: 5

### COURSE OBJECTIVES:

- Describe the basic mechanisms, distinctions and functional interplay of innate and adaptive immunity
- Define the cellular/molecular pathways of humoral/cell-mediated adaptive responses
- Define the basic mechanisms that regulate immune responses and maintain tolerance
- To demonstrate the molecular basis of complex, cellular processes involved in inflammation and immunity, in states of health and disease.
- Describe basic and state-of-the-art experimental methods and technologies

### UNIT – I INTRODUCTION TO IMMUNOLOGY:

Historical perspective: contribution by Metchnikoff, Edward Jenner, Louis Pasteur and Wu and Kabat. Types of immunity – innate and acquired. Humoral and cell mediated immunity. Central and peripheral lymphoid organs – Thymus, bone marrow, spleen, lymph nodes and other peripheral lymphoid tissues – MALT, GALT and CALT. Cells of the immune system- lymphocytes, mononuclear phagocytes – dendritic cells, granulocytes, NK cells and mast cells. Immunoglobulins – structure, classification and functions. Idiotypic network hypothesis. Antigen, types of antigen, antigen Vs immunogens, Haptens. Factors influencing immunogenicity. Isotypes, allotypes and idiotypes.

### UNIT – II COMPLEMENT PATHWAYS:

Complement system: components of complement activation and its biological consequences – classical, alternative and lectin pathways. **Clonal selection theory**. Organization and expression of immunoglobulin genes, generation of antibody diversity. Class switching. **Overview of B cell & T cell**, types of immune response, T – cell, B- cell receptors, Antigen



recognition – processing and presentation to T- cells. Interaction of T and B cells. Effector mechanisms – macrophage activation. Cell mediated cytotoxicity, Cytokines types.

### **UNIT – III MAJOR HISTOCOMPATIBILITY COMPLEX:**

Major Histocompatibility complex (MHC): MHC genes and products. Polymorphism of MHC genes, role of MHC antigen in immune response, MHC antigens in transplantation. Transplantation types, allograft rejection mechanism, regulation of immune response : immune tolerance and immunosuppression. Immune response to infectious diseases – Viral, bacterial and protozoal. AIDS and other immunodeficiency disorders. Autoimmunity: Mechanism of induction of organ specific and systemic autoimmune diseases. **Hypersensitivity** – types. Immune response to cancer, immunotherapy. UNIT – IV VACCINES:

Immunization practices – active and passive immunization. Vaccines – killed, attenuated – toxoids. Recombinant vector vaccines – DNA vaccines, synthetic peptide vaccines – anti idiotypic vaccines. Humanized antibodies and plantibodies  
.Production of polyclonal and monoclonal antibodies. Principles, techniques and application. Genetically engineered antibodies. Abzymes.

### **UNIT – V IMMUNOTECHNIQUES:**

Immunotechniques: Agglutination and precipitation technique. Immuno – electrophoresis, RIA, immunoblotting, Avidin – biotin mediated immunoassay. Immunohistochemistry – immunofluorescence, immunoferritin technique. Fluorescent immunoassay, fluorescence activated cell sorting (FACS). Cytokines assay: ELISA and ELISPOT. Lymphocytes transformation test (LTT); Lymphoblastoid cell lines. Experimental animal models: inbred strains, SCID mice, nude mice, knockout mice fully cloned animals.

### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent studies on Auto-immune disorders, Hypersensitivity. Dynamics of the immune response. The immune response in health and disease. Immunity against covid-19 infections

### **COURSE OUTCOMES:**

1. Describe the basic mechanisms, distinctions and functional interplay of innate and





adaptive immunity. Define the cellular/molecular pathways of humoral/cell-mediated adaptive responses.

2. Define the basic mechanisms that regulate immune responses and maintain tolerance.
3. Understand the molecular basis of complex, cellular processes involved in inflammation and immunity, in states of health and disease .
4. Describe basic and state-of-the-art experimental methods and technologies.
5. Integrate knowledge of each subsystem to see their contribution to the functioning of higher-level systems in health and disease. Apply understanding of basic and state-of-the-art experimental methods and technologies in the design of research plans to test specific hypotheses.

## IMMUNOLOGY

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC41: 1</b>	3	3	3	2	3
<b>P22BCCC41: 2</b>	3	3	3	3	3
<b>P22BCCC41: 3</b>	3	3	3	3	3
<b>P22BCCC41: 4</b>	3	3	3	2	3
<b>P22BCCC41: 5</b>	3	3	3	2	3
<b>Optimum point</b>	3	3	3	2	3





**Second Year**

**CORE COURSE VIII**

**Semester IV**

## **MOLECULAR BIOLOGY**

**Code: P22BCCC42**

**(Theory)**

**Credit: 5**

### **COURSE OBJECTIVES:**

- This course is about genes - their structure and function - therefore, students will study the mechanics of replication, repair, transcription, and translation in bacteria, archaea and eukaryotes.
- A central goal is to understand gene regulation at all levels, and the structure- function relationships of nucleic acids and proteins.

### **UNIT - I CENTRAL DOGMA OF LIFE:**

DNA as the genetic material, supercoiling, hybridization. Hierarchy of Chromatin Organisation, Central Dogma, Unique sequence DNA, Repetitive DNA – SINES, LINEs, Satellite, Minisatellite and Microsatellite DNAs, C-Value Paradox. E.Coli Chromosome and plasmids, Mitochondrial and Chloroplast Genomes. Concept of genes. Structure of Protein-coding genes in prokaryotes and eukaryotes.

### **UNIT - II DNA REPLICATION, REPAIR AND MUTATION:**

DNA in prokaryotes and eukaryotes. Mode of replication; experimental findings of Meselson & Stahl. Enzymes involved in replication, events on the replication fork and termination, mechanism of replication. Inhibitors of DNA replication and DNA repair mechanisms (Direct repair, excision repair, mismatch repair, recombination repair, SOS response, Eukaryotic repair system). Type of damages and mutation – point mutation and frameshift mutation. Suppressor Gene mutation and chromosomal aberration.

### **UNIT - II TRANSCRIPTION:**

Organization of transcriptional units – prokaryotes and eukaryotes. RNA polymerases – structure and functions. Promoters, transcription factors, transcription complex assembly and mechanism of transcription- Transcriptional regulation –hormonal (steroid hormone receptors), phosphorylation (STAT proteins). Post-transcriptional processing. Alternative splicing. Catalytic RNA (ribozymes), antisense RNA. Inhibitors of transcription.

### **UNIT - IV TRANSLATION:**

The genetic code – specificity, redundancy and wobble hypothesis. Mitochondrial and chloroplast genetic codons. Components of protein synthesis– mRNA, rRNA and tRNA. Mechanism of protein synthesis. Regulation of protein synthesis - constitutive and narrow domain regulation. Inhibition of protein synthesis. Co- and post-translational modifications. Protein targeting- the signal sequence hypothesis, targeting proteins to membranes, nucleus and intracellular organelles. Protein degradation - ubiquitin pathway. Protein folding - models,

molecular chaperones.UNIT - V      GENE EXPRESSION AND REGULATION:

Levels of gene expression. Principles of gene regulation. Upregulation, downregulation, induction and repression. Operon models- Lac operon, Trp operon. Comparison of gene regulation strategies in prokaryotes and eukaryotes. Genetic and epigenetic gene regulation by DNA methylation. Methylation and gene regulation in mammals and plants. Epigenetic gene regulation by DNA methylation in mammals - role of imprinting and X-chromosome inactivation.

### UNIT - VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):

Role of antibiotics and other inhibitors of Prokaryotic and eukaryotic replication/transcription/translation.

### COURSE OUTCOMES:

1. The course gives deep insight into the molecular mechanisms behind the existence of life.
2. Students will understand the structure and organization of genomes and its functions in lower to higher forms of life.
3. Students will learn about the regulation of gene expression.
4. Course covers the fundamental molecular causes behind the several non-communicable and communicable diseases.
5. Enables the students to pursue careers in healthcare and clinical research.

## MOLECULAR BIOLOGY

### CO - PO matrices of course

K1= Slight (Low)   K2= Moderate (Medium)   K3 = Substantial (High)

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCCC42: 1</b>	3	3	-	-	3
<b>P22BCCC42: 2</b>	3	3	-	-	3
<b>P22BCCC42: 3</b>	3	3	-	-	3
<b>P22BCCC42: 4</b>	3	3	-	-	3
<b>P22BCCC42: 5</b>	3	3	-	2	3
<b>Optimum Point</b>	3	3	-	2	3





**Second Year**

**Semester IV**

## **Entrepreneur /Industry Based Course**

**Code: P22BCIBC**

**Industrial Chemistry**

**Credit: 5**

### **COURSE OBJECTIVES:**

- . To teach students about concepts of entrepreneurship including identifying a winning business opportunity, gathering funding and launching a business, growing and nurturing the organization and harvesting the rewards.
- a. Illustrate the basics of bio-business in various emerging biological field
- b. Build critical thinking capability and design methodologies for entrepreneur
- c. Create the ability for planning, commencing, executing and managing business

### **UNIT – I Introduction to Bio business:**

Introduction to Bio-business, Fundamentals of Biotech for bio-Business, Contemporary Vs antique Bio-business, Wealth Creation in Bio-business. Entrepreneurship development programs of public and private agencies (MSME, DBT, BIRAC, Make in India), strategic dimensions of patenting & commercialization strategies.

### **UNIT – II Biosciences in Business:**

Healthcare, Biomedical sciences, Industrial Life Sciences, Biotechnology, Agriculture based business, Food Industry; Where Things Stand: A Quick Survey of Regional and Global Strengths and Capabilities. Business related to Environment Management, Bioremediation, Bioleaching and waste management.

### **UNIT – III Bio markets - business strategy and marketing:**

Negotiating the road from lab to the market (strategies and processes of negotiation with financiers, government and regulatory authorities), Pricing strategy, Challenges in marketing in bio-business (market conditions & segments; developing distribution channels, the nature, analysis and management of customer needs), Basic contract principles, different types of agreement and contract terms typically found in joint venture and development agreements,



Dispute resolution skills.

## **UNIT - 1V Protecting the Intellectual Property:**

Introduction to intellectual property; types of IP: patents, trademarks, copyright & related rights, industrial design, traditional knowledge, geographical indications, protection of new GMOs; International framework for the protection of IP; IP as a factor in R&D; IPs of relevance to biotechnology and few case studies; introduction to history of GATT, WTO, WIPO and TRIPS; plant variety protection and farmers rights act; concept of 'prior art': invention in context of "prior art"; patent databases - country-wise patent searches (USPTO, EPO, India); analysis and report formation.

## **UNIT - V Patenting: Basics of patents:**

Types of patents; Indian Patent Act 1970; recent amendments; WIPO Treaties; Budapest Treaty; Patent Cooperation Treaty (PCT) and implications; procedure for filing a PCT application; role of a Country Patent Office; filing of a patent application; precautions before patenting-disclosure/non-disclosure - patent application- forms and guidelines including those of National Bio-diversity Authority (NBA) and other regulatory bodies, fee structure, time frames; types of patent applications: provisional and complete specifications; PCT and conventional patent applications; international patenting-requirement, procedures and costs; financial assistance for patenting-introduction to existing schemes; publication of patents-gazette of India, status in Europe and US; patent infringement- meaning, scope, litigation, case studies and examples; commercialization of patented innovations; licensing - outright sale, licensing, royalty; patenting by research students and scientists-university/organizational rules in India and abroad, collaborative research - backward and forward IP; benefit/credit sharing among parties/community, commercial (financial) and non-commercial incentives.

## **UNIT - VI Finance and accounting (For Continuous Internal Assessment Only):**

Business plan preparation including statutory and legal requirements, Business feasibility study, and financial management issues of procurement of capital and management of costs, Collaborations & partnership, Information technology.



## **COURSE OUTCOMES:**

1. Students should be able to gain entrepreneurial skills, understand the various operations involved in venture creation,
2. Identify scope for entrepreneurship in biosciences and utilize the schemes promoted through knowledge centers and various agencies.
3. The knowledge pertaining to management should also help students to be able to build up a strong network within the industry.
4. Evaluate and develop critical thinking leading to innovative skills related to business.
5. Develop the protocol to approach funding agencies both government and non-government

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## Entrepreneur /Industry Based Course

### Industrial Chemistry

#### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCIBC: 1</b>	3	3	3	2	2
<b>P22BCIBC: 2</b>	2	2	3	2	3
<b>P22BCIBC: 3</b>	2	3	3	2	3
<b>P22BCIBC: 4</b>	2	3	3	2	2
<b>P22BCIBC: 5</b>	1	2	3	3	2
<b>Optimum Point</b>	2	3	3	2	2





**Second Year**

**VALUE ADDED COURSE II**

**Semester IV**

**VALUE ADDITION IN FOOD**

**Code: P22BCVAC2**

**(Theory)**

**Credit: 5**

## **COURSE OBJECTIVES:**

- To study the process of and provide a new perspective on value adding, with an emphasis towards 'authenticity' in food
- This course delivers new knowledge and provides future direction to small scale farming Producers and the wider food industry

## **UNIT – I FOOD SCIENCE AND TECHNOLOGY:**

Methods of food preservation, Use of non-thermal technologies, alternate-thermal technologies, infrared biological technologies -antimicrobial enzymes and bacteriocins in food processing.

## **UNIT – II FRUITS AND VEGETABLES:**

Value addition and storage of fruits and vegetables. Fruit juice, jam, jelly, marmalade, squash, candies, tomato sauce, ketchup, and puree, chips, pickles. Dehydrated fruits and vegetables. Fermented foods and beverages from fruit and vegetables.

## **UNIT – III FOOD GRAINS, SPICES AND PLANTATION CROPS:**

Anti-nutritional factors in food grains and oilseeds. Value added food grain products like breads, biscuits, cakes, doughnuts, buns, pasta goods, extruded, Instant ready mixtures, puffed foods, confectionary products, breakfast cereals, snack foods, malted food products, legume based food products.

## **UNIT – IV DAIRY PRODUCTS:**





Reconstituted and flavored milks. Technology of fermented milks. Milk products processing viz. cream, butter, ghee, cheese, condensed milk, evaporated milk, whole and skimmed milk powder, ice cream, khoa, channa, paneer and similar products. **Food Fortification:** Fortification of bread, pasta, noodles, biscuits, and breakfast cereals. Micronutrient fortification of snack products. Other special fortified products - salt, sugars, milk and oils. Safety limits

## **UNIT – V MEAT FISH AND POULTRY PRODUCTS:**

Meat and poultry preservation like curing, smoking, freezing, canning and dehydration Value addition and byproducts utilizations. Factors influencing keeping quality of meat. Processing and preservation of fish and its products. Preservation canning, smoking and freezing of fresh and sea water fish and its products. Utilization of by-products from fish processing industries. Preservation methods of shell eggs and egg products freezing- pasteurization- desugarization . Technology of egg products viz. egg powder, albumen and flakes.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Examples of how to make value-added food products like making salsa out of your tomatoes, make jam or jelly out of your berries

## **COURSE OUTCOMES:**

Upon completion the students will come to understand;

- The principles of preservation and the methods of preservation.
- Acquire skills to formulate fruits based preserved products with value addition for nutritional benefits.
- Explore the principle of preservation in vegetables based products with nutritive value.
- Prepare cereals and pulses based on preserved products focusing on the principle of preservation.
- Develop new products with maximum retention of essential nutrients.



## VALUE ADDITION IN FOOD

### CO - PO matrices of course

K1= Slight (Low) K2= Moderate (Medium) K3 = Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>P22BCVAC2: 1</b>	3	2	-	2	2
<b>P22BCVAC2: 2</b>	2	-	1	2	3
<b>P22BCVAC2: 3</b>	2	1	2	2	2
<b>P22BCVAC2: 4</b>	2	1	2	2	2
<b>P22BCVAC2: 5</b>	3	3	3	3	3
<b>Optimum Point</b>	2	1	1	3	2



**SHRIMATI INDIRA GANDHI COLLEGE**

(Nationally Accredited at 'A' Grade (3<sup>rd</sup> Cycle) by NAAC)

TIRUCHIRAPPALLI-620 002

**PG & RESEARCH DEPARTMENT OF MATHEMATICS**

**M.Sc., Mathematics**

**PROGRAMME OUTCOMES:**

**PO1:** Master Degree Programme in Mathematics will meet the present day needs of academic and Research, Institutions and Industries.

**PO2:** Students may acquire depth knowledge in Algebra, Analysis, Topology, Functional Analysis, Optimization Techniques and Graph Theory which will motivate the students to go for higher studies/research in Mathematics.

**PO3:** Inculcate critical thinking to carry out scientific investigation objectively without being biased with preconceived notions.

**PO4:** Prepare students for pursuing research or careers in mathematical sciences and applied fields.

**PO5:** Equip the student with skills to analyze problems, formulate a hypothesis, evaluate and validate results, and draw reasonable conclusions thereof.

**PROGRAMME SPECIFIC OUTCOMES:**

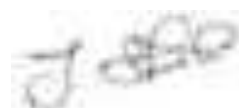
**PSO1:** Mastery of Fundamental Mathematical Concepts (Algebra, Analysis, Geometry)

**PSO2:** Will gain the ability to understand and deal with abstract concepts

**PSO3:** Communicate mathematical concepts effectively

**PSO4:** Ability to think critically and creatively

**PSO5:** Analyze and model real world problems based on mathematical principles



Signature of the HOD

## I SEMESTER

### CORE COURSE I ALGEBRA-P22MACC11

#### UNIT - I:

Set Theory – Mappings – Group – Subgroups – A counting Principle - Normal Subgroups and Quotient groups.

#### UNIT - II:

Homomorphism – Cayley's theorem – Permutation groups – Another counting principle – Sylow's theorems.

#### UNIT - III:

Homomorphisms -Ideals and quotient rings – More ideals and quotient rings – Euclidean Rings-A particular Euclidean Ring.

#### UNIT - IV:

Polynomial rings – Polynomials over the rational field – polynomials over commutative Rings -Inner Product spaces.

#### UNIT - V:

**FIELDS:** Extension fields – Roots of Polynomials – More about roots – The elements of Galois theory– Finite fields.

#### UNIT - VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Classification of finite Groups - Commutative rings, Applications of field theory to coding theory.

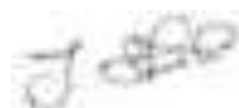
#### Course Outcome

**CO1 :** Gain expertise in the basic concepts of group theory with the help of numerous examples.

**CO2 :** Discuss in detail about permutation groups and Normal subgroups and discuss on counting tricks in algebra.

**CO3 :** Bring out the key steps involved in proving Sylow theorems and use Sylow's theorems to classify groups of finite order upto 120.

**CO4 :** Learn the fundamental concept in field theory of field extensions and would see the idea of generating new fields.



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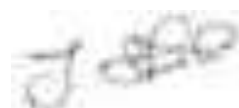
**CO5** : Have clear cut idea in the notions of Galois groups, normal extensions and separable extensions and illustrate them with various examples.  
**CO6**: Able to understand the Fundamental theorem of Galois theory.

**COURSE MAPPING  
 ALGEBRA - P22MACC11**

**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
 If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	2	3	2
<b>CO2</b>	3	3	2	2	2
<b>CO3</b>	3	3	1	2	3
<b>CO4</b>	3	2	2	2	3
<b>CO5</b>	2	3	3	3	2
<b>CO6</b>	2	2	1	3	2
<b>Average</b>	3	3	2	3	2



Signature of the HOD

## **CORE COURSE II**

### **REAL ANALYSIS- P22MACC12**

#### **UNIT I**

The Real and Complex Number Systems: Introduction – Ordered sets – Fields– The Real Field – Extended Real Number system–The Complex Field – Euclidean Spaces. Basic topology: Finite, countable and uncountable sets – Metric Spaces – Compact sets – Perfect sets – Connected sets.

#### **UNIT II**

Numerical Sequences: Convergent Sequences – Sub-sequences – Cauchy Sequences – Upper and Lower Limits – Some Special Sequences – Series– Series of Non-Negative Terms. Numerical Series: The Number  $e$  – The Root and Ratio Test – Power Series – Summation by Parts – Absolute Convergence– Addition and Multiplication of Series - Rearrangements.

#### **UNIT III**

Continuity: Limits of Functions - Continuous Functions – Continuity and Compactness – Continuity and Connectedness – Discontinuities – Monotonic Functions – Infinite Limits and Limits at Infinity. Differentiation: The Derivative of a Real Function – Mean Value Theorems – The Continuity of Derivatives – L'Hospital's Rule – Derivatives of Higher Order – Taylor's Theorem – Differentiation of Vector Valued Functions.

#### **UNIT IV**

The Riemann-Stieltjes Integral: Definition and existence of the integral – Properties of the Integral – Integration and Differentiation – Integration and vector valued functions – Rectifiable curves.

#### **UNIT V**

Sequence and Series of Functions: Sequence of Functions – Discussion of Main Problem–Uniform Convergence and Continuity –Uniform Convergence and Integration – Uniform Convergence and Differentiation. Families of Functions: Equi continuous Families of Functions – The Stone – Weierstrass Theorem.

#### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Generalizations to topological spaces, Calculus on Manifolds.

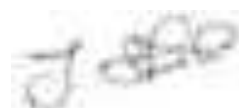
#### **Course Outcome**

**CO1 :** Describe fundamental properties of the real numbers that lead to the formal development of real analysis.

**CO2 :** Demonstrate an understanding of limits and how that are used in sequences.

**CO3 :** Demonstrate an understanding of limits and how that are used in series.

**CO4 :** Demonstrate an understanding of limits and how that are used in sequences  
Examine and recognize the continuity of real functions.



Signature of the HOD

**CO5** : Demonstrate an intuitive and computational understanding of set theory, Continuity and solving application problems. This will be assessed through homework, class quizzes and tests, and a final exam.

**COURSE MAPPING**

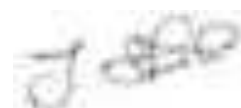
**REAL ANALYSIS-P22MACC12**

**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	3	2	3	3
<b>CO2</b>	2	3	3	3	2
<b>CO3</b>	2	3	3	3	2
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3



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### **CORE COURSE III**

#### **ORDINARY DIFFERENTIAL EQUATIONS- P22MACC13**

##### **UNIT I**

The general solution of the homogeneous equation – the use of one known solution to find another – The method of variation of parameters – Power Series solutions. A review of power series – Series solutions of first order equations – Second order linear equations; Ordinary points.

##### **UNIT II**

Regular Singular Points – Gauss's hypergeometric equation – The Point at infinity – Legendre Polynomials – Bessel functions – Properties of Legendre Polynomials and Bessel functions.

##### **UNIT III**

Linear Systems of First Order Equations – Homogeneous Equations with Constant Coefficients – The Existence and Uniqueness of Solutions of Initial Value Problem for First Order Ordinary Differential Equations – The Method of Solutions of Successive Approximations and Picard's Theorem.

##### **UNIT IV**

Oscillation Theory and Boundary value problems – Qualitative Properties of Solutions – Sturm Comparison Theorems – Eigen values, Eigen functions and the Vibrating String.

##### **UNIT V**

Nonlinear equations: Autonomous Systems; the phase plane and its phenomena – Types of critical points; Stability – critical points and stability for linear systems – Stability by Liapunov's direct method – Simple critical points of nonlinear systems.

##### **UNIT VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

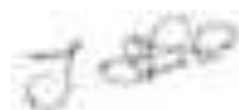
System of ode and using Canonical forms to solve.

##### **Course Outcome**

**CO1:** Find the general solution of the first order linear homogeneous equations.

**CO2:** Understand the utility of the theory of power series which is studied in Real Analysis course through solving various second order differential equations.

**CO3:** Get introduced to the Hypergeometric functions which arises in connection with solutions of the second order ordinary differential equations with regular singular points.



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**CO4:** Solve the problems arises in Mathematical physics using properties of special functions.

**CO5:** Understand the importance of studying well-posedness of the problem namely existence, uniqueness and continuous dependence of first order differential equations through Picard's theorem.

**CO6:** Understand the utility of the concepts from linear algebra and analysis in the study of system of first order equations.

**CO7:** Discuss the Qualitative properties of solutions of first and second order equations. Also they will be able to work on numerous problems using comparison theorem in Sturm Liouville problems.

**CO8:** Learn the nature of solutions which involves critical points and phase portrait of nonlinear equations.

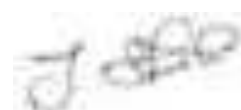
### COURSE MAPPING

#### ORDINARY DIFFERENTIAL EQUATIONS- P22MACC13

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put "-"

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	2	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	2	3	2
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	2	3	3
<b>CO6</b>	3	3	2	2	3
<b>CO7</b>	2	3	2	3	3
<b>CO8</b>	3	2	2	3	3
<b>Average</b>	3	3	2	3	3



Signature of the HOD

## **CORE CHOICE COURSE I**

### **CLASSICAL DYNAMICS- P22MACC1A**

#### **Unit I**

Introductory concepts: The mechanical system - Generalised Coordinates - constraints - virtual work - Energy and momentum.

#### **Unit II**

Lagrange's equation: Derivation and examples - Integrals of the Motion - Small oscillations.

#### **Unit III**

Special Applications of Lagrange's Equations: Rayleigh's dissipation function - impulsive motion - Gyroscopic systems - velocity dependent potentials.

#### **Unit IV**

Hamilton's equations: Hamilton's principle - Hamilton's equations - Other variational principles - phase space.

#### **Unit V**

Hamilton - Jacobi Theory: Hamilton's Principal Function - The Hamilton - Jacobi equation - Separability.

#### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Introduction to relativity

### **Course Outcome**

**CO1 :** Understand the important definitions and introductory concepts like the ideas of virtual work and d'Alembert's principle.

**CO2 :** Derive Lagrange's equations of motion using d'Alembert's principle.

**CO3 :** Understand the nature of equations of motion for holonomic and nonholonomic systems.

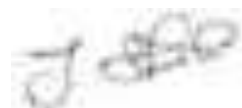
**CO4 :** Understand the idea of impulsive constraints.

**CO5 :** Compare dissipative systems and velocity dependent potentials.

**CO6 :** Understand the Hamiltonian view point of dynamics in canonical equations of motion and phase space.

**CO7:** Understand the concepts of Hamilton - Jacobi theory.

**CO8:** Obtain some concrete procedure for solving problems using the theory of canonical transformations.



Signature of the HOD

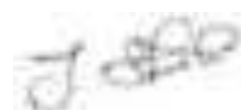
## COURSE MAPPING

### CLASSICAL DYNAMICS- P22MACC1A

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	2	3	3
<b>CO2</b>	2	2	2	3	3
<b>CO3</b>	3	2	3	3	3
<b>CO4</b>	3	2	3	3	2
<b>CO5</b>	3	2	3	3	2
<b>CO6</b>	2	2	2	3	3
<b>CO7</b>	3	2	3	3	3
<b>CO8</b>	3	2	3	3	3
<b>Average</b>	3	2	3	3	3



Signature of the HOD

## **ELECTIVE COURSE I**

### **GRAPH THEORY- P22MAE1A**

#### **UNIT – I:**

Basic Results: Basic Concepts - Subgraphs - Degrees of Vertices - Paths and Connectedness- Operations on Graphs - Directed Graphs: Basic Concepts – Tournaments.

#### **UNIT – II:**

Connectivity: Vertex Cuts and Edge Cuts - Connectivity and Edge - Connectivity, Trees: Definitions, Characterization and Simple Properties - Counting the Number of Spanning Trees - Cayley's Formula.

#### **UNIT – III:**

Independent Sets and Matchings: Vertex Independent Sets and Vertex Coverings - Edge Independent Sets -Matchings and Factors - Eulerian Graphs - Hamiltonian Graphs.

#### **UNIT – IV:**

Graph Colourings: Vertex Colouring - Critical Graphs - Triangle - Free Graphs - Edge Colourings of Graphs - Chromatic Polynomials.

#### **UNIT – V:**

Planarity: Planar and Nonplanar Graphs - Euler Formula and its Consequences -  $K_5$  and  $K_{3,3}$  are Nonplanar Graphs - Dual of a Plane Graph - The Four-Colour Theorem and the Heawood Five-Colour Theorem-Kuratowski's Theorem.

#### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

The Four Color Conjecture

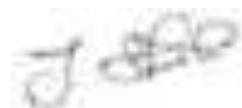
#### **Course Outcome**

**CO1** : Understand and work on the fundamental concepts of graphs.

**CO2** : Apply graph theory based tools in solving practical problems.

**CO3** : Understand basic concepts in Trees and discuss matching problems and its applications elsewhere.

**CO4** : Comprehend and work on the concepts of planarity and discuss the dual of a plane graph.



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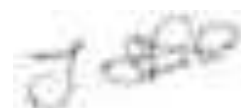
## COURSE MAPPING

### GRAPH THEORY- P22MAE1A

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	2
CO4	2	3	3	3	2
AVE	3	3	3	3	3



Signature of the HOD

## II SEMESTER

### CORE COURSE IV

### COMPLEX ANALYSIS-P22MACC21

#### UNIT - I:

Elementary Point Set Topology: Sets and Elements - Metric Spaces - Connectedness - Compactness - Continuous Functions - Topological Spaces; Conformality: Arcs and Closed Curves - Analytic Functions in Regions - Conformal Mapping - Length and Area; Linear Transformations: The Linear Group - The Cross Ratio - Symmetry.

#### UNIT - II:

Fundamental theorems in complex integration: Line Integrals - Rectifiable Arcs - Line Integrals as Functions of Arcs - Cauchy's Theorem for a Rectangle - Cauchy's Theorem in a Disk; Cauchy's Integral Formula: The Index of a Point with Respect to a Closed Curve - The Integral Formula - Higher Derivatives.

#### UNIT - III:

Local Properties of Analytic Functions - Removable Singularities - Taylor's Theorem - Integral representation of the  $n$ th term - Zeros and Poles - Algebraic order of  $f(z)$  - Essential Singularity - The Local Mapping - The Open Mapping Theorem - The Maximum Principle.

#### UNIT - IV:

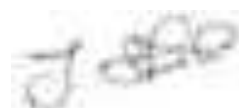
The General Form of Cauchy's Theorem: Chains and Cycles - Simple Connectivity - Homology - The General Statement of Cauchy's Theorem - Proof of Cauchy's Theorem - Locally Exact Differentials - Multiply Connected Regions; The Calculus of Residues: The Residue Theorem - The Argument Principle - Evaluation of Definite Integrals.

#### UNIT - V:

Harmonic Functions: Definition and Basic Properties - The Mean-value Property - Poisson's Formula - Schwarz's Theorem - The Reflection Principle; Power series expansions-Weierstrass's Theorem - The Taylor Series - The Laurent Series.

#### UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Analytic Continuation - Global version of Cauchy's theorem



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### Course Outcome

**CO1** : Understand the complex number system from geometric view point. Will gain mastery in arguments on  $C^*$  and logarithms.

**CO2** : Get expertise in the concept of convergence of sequences and series of complex numbers, continuity and differentiability of function on complex numbers. Also the students will be able to thoroughly understand and know the importance of power series in complex analysis.

**CO3** : Workout the path integrals on the complex plane.

**CO4** : Understand the central theme of Cauchy theory, viz., existence of local primitives and local power series expansion.

**CO5** : Get acquainted with various techniques of proving fundamental theorem of algebra, open mapping theorem, maximum modulus theorem and Liouville's theorem.

**CO6** : Classify singularities, compute poles and residues and understand the Laurent series expansion.

**CO7** : Appreciate and work on the topology of extended complex plane.

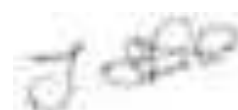
### COURSE MAPPING

#### COMPLEX ANALYSIS-P22MACC21

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO/PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	3	2	2	2
CO3	2	3	3	2	2
CO4	3	3	3	2	2
CO5	2	3	3	3	2
CO6	3	3	2	2	2
CO7	2	3	3	3	3
Average	3	3	3	2	2



Signature of the HOD

## **CORE COURSE V**

### **LINEAR ALGEBRA-P22MACC22**

#### **UNIT – I:**

Matrices: Systems of linear Equations - Matrices and Elementary Row operations - Row-reduced echelon Matrices - Matrix Multiplication - Invertible Matrices - Bases and Dimension. (Only revision of Vector spaces and subspaces).

#### **UNIT – II:**

Linear transformations: The algebra of linear transformations - Isomorphism of Vector Spaces - Representations of Linear Transformations by Matrices - Linear Functionals - The Double Dual - The Transpose of a Linear Transformation.

#### **UNIT – III:**

Algebra of polynomials: The algebra of polynomials - Lagrange Interpolation - Polynomial Ideals - The prime factorization of a polynomial - Commutative rings - Determinant functions.

#### **UNIT – IV:**

Determinants: Permutations and the uniqueness of determinants - Classical Adjoint of a (square) matrix - Inverse of an invertible matrix using determinants - Characteristic values - Annihilating polynomials.

#### **UNIT – V:**

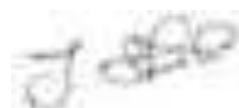
Diagonalization: Invariant subspaces - Simultaneous triangulation and simultaneous Diagonalization Direct-sum Decompositions - Invariant Direct sums - Primary Decomposition theorem.

#### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Introduction to Module theory

#### **Course Outcome**

- CO1** : Realise that the subject evolves as a generalization of solving a system of linear equations.
- | **CO2** : Discuss in detail the basic concepts of Linear dependence, basis and dimension of a vector space. The students will be able to demonstrate how the geometric ideas turn into rigorous proofs.
- | **CO3** : Master the dimension formula and rank and nullity theorem which are often exploited.



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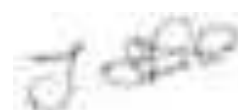


- | **CO4** : Capture the idea of producing lot of structure preserving maps (Linear transformations). Further the study of algebras of linear maps would be accomplished.
- | **CO5** : Having got trained in numerous examples the student realizes the isomorphic theory of linear transformations and matrices.
- | **CO6** : Learn the theory of determinants and put them in practice.
- | **CO7** : Understand that the central theme of structure theory of linear maps is to decompose the given vector space as a direct sum of generalized the Eigen spaces using the given map on it.
- | **CO8** : Understand that linear Algebra plays a fundamental role in many areas of mathematics including Algebra, Geometry, Functional analysis and which finds widest application in Physics, Chemistry and elsewhere.

**COURSE MAPPING**  
**LINEAR ALGEBRA-P22MACC22**  
**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
 If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	2	3	2	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	2	3	3	2	2
<b>CO4</b>	2	3	3	2	2
<b>CO5</b>	2	2	3	2	2
<b>CO6</b>	2	3	3	2	2
<b>CO7</b>	2	2	3	2	3
<b>CO8</b>	3	3	3	3	3
<b>Average</b>	2	3	3	2	3



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## **CORE CHOICE COURSE II**

### **PARTIAL DIFFERENTIAL EQUATIONS - P22MACC2A**

#### **UNIT – I:**

Partial differential equations- origins of first order Partial differential equations- Cauchy's problem for first order equations- Linear equations of the first order- Integral surfaces Passing through a Given curve- surfaces Orthogonal to a given system of surfaces -Nonlinear Partial differential equations of the first order.

#### **UNIT – II:**

Cauchy's method of characteristics- compatible systems of first order equations- Charpits method- Special types of first order equations- Solutions satisfying given conditions- Jacobi's method.

#### **UNIT – III:**

Partial differential equations of the second order: The origin of second order equations –second order equations in Physics – Higher order equations in Physics  
- Linear partial differential equations with constant co-efficient- Equations with variable coefficients-Characteristic curves of second order equations.

#### **UNIT – IV:**

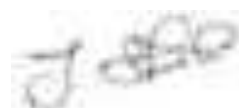
Characteristics of equations in three variables- The solution of Linear Hyperbolic equations-Separation of variables.The method of Integral Transforms – Non Linear equations of the second order.

#### **UNIT – V:**

Laplace equation: Elementary solutions of Laplace's equations-Families of equipotential Surfaces- Boundary value problems-Separation of variables – Problems with Axial Symmetry.

#### **UNIT – VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Greens function - Theory of distributions.



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## Course Outcomes

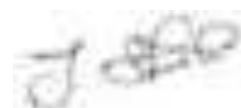
- CO1 : Classify first order partial differential equations and their solutions.
- | CO2 : Solve first order equations and nonlinear partial differential equations using various methods.
- ☑ CO3 : Use the method of characteristics to solve first order partial differential equations.
- ☑ CO4 : Identify and solve the three main classes of second order equations, elliptic, parabolic and hyperbolic.
- ☑ CO5 : Solve one dimensional wave equations using method of separation of variables.
- ☑ CO6 : Classify the boundary value problems and analyse its solutions.
- | CO7 : Solve Heat conduction problem using Fourier series and cosines.
- ☑ CO8 : Illustrate the use of PDE in problems from Engineering and Biological Sciences.

### COURSE MAPPING PARTIAL DIFFERENTIAL EQUATIONS-P22MACC2A

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	2	3	3	3
CO6	3	3	2	2	3
CO7	2	3	3	3	3
CO8	3	2	3	3	3
Average	3	3	3	3	3



Signature of the HOD

## **ELECTIVE COURSE II**

### **OPTIMIZATION TECHNIQUES-P22MAE2A**

#### **UNIT - I:**

Linear Programming Problem – Pure and Mixed Integer Programming Problems – Gomory's All I.P.P. Method – Construction of Gomory's Constraints - Fractional Cut Method-All Integer LPP – Fractional Cut Method-Mixed Integer LPP – Branch and Bound Method – Applications of Integer Programming.

#### **UNIT - II:**

Dynamic Programming – The Recursive Equation Approach – Characteristics of Dynamic Programming – Dynamic Programming Algorithm – Solution of Discrete DPP – Applications – Solution of LPP by Dynamic Programming.

#### **UNIT - III:**

Goal Programming – Categorisation of Goal Programming – Formulation of Linear Goal Programming Problem – Graphical Goal Attainment Method – Simplex Method for Goal Programming Problem.

#### **UNIT - IV:**

Non-Linear Programming - Formulation - constrained optimization - with equaling constraints, with in-equaling constraints - saddle point problems.

#### **UNIT - V:**

Non-Linear Programming problems Methods - Graphical sign - Kuhn-Tucker conditions with non- negative constrains - quadratic programming - Wolfe's modified simplex method - Beale's method - separable convex programming - separable programming Algorithm.

#### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Solving problems using PYTHON Programming

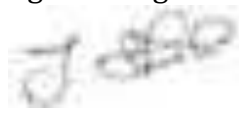
#### **COURSE OUTCOMES:**

**CO1:** Do mathematical formulation of a real-life problem into a linear programming problem.

**CO2:** Solve linear programming problem using graphical method and simplex method.

**CO3:** Understand Integer programming problem.

**CO4:** Find solutions to linear programming problem by dynamic programming.

  
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**CO5:** Understand the concepts of nonlinear programming problems.

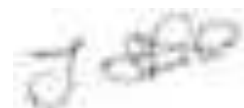
**CO6:** Solve nonlinear programming problems using Wolfe's method and Beale's method.

**COURSE MAPPING**  
**OPTIMIZATION TECHNIQUES-P22MAE2A**

**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>P22MAE2A.1</b>	3	3	3	3	3
<b>P22MAE2A.2</b>	3	3	2	3	3
<b>P22MAE2A.3</b>	3	3	2	3	2
<b>P22MAE2A.4</b>	3	3	3	2	3
<b>P22MAE2A.5</b>	3	3	2	3	2
<b>P22MAE2A.6</b>	3	3	3	2	3
<b>P22MAE2A</b>	3	3	3	3	3



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## **ELECTIVE COURSE II**

### **STOCHASTIC PROCESSES - P22MAE2A**

#### **UNIT – I:**

**Stochastic Processes: Some notions – Specification of Stochastic processes – Stationary processes – Markov Chains – Definitions and examples – Higher Transition probabilities – Generalization of independent Bernoulli trials.**

#### **UNIT – II:**

**Markov chains: Classification of states and chains – determination of Higher transition probabilities – stability of a Markov system – Reducible chains – Markov chains with continuous state space.**

#### **UNIT – III:**

**Markov processes with Discrete state space: Poisson processes and their extensions – Poisson process and related distribution – Generalization of Poisson process- Birth and Death process – Markov processes with discrete state space (continuous time Markov Chains).**

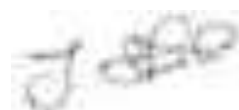
#### **UNIT – IV:**

**Renewal processes and theory: Renewal process – Renewal processes in continuous time – Renewal equation – stopping time – Wald's equation – Renewal theorems.**

#### **UNIT – V:**

**Branching Processes: Introduction – Properties of generating functions of Branching process – Probability of extinction – Distribution of the total number of progeny – Conditional Limit Laws due to Kolmogrov and due to Yaglom – Classical Galton-Watson Process - Bellman-Harris Process**

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):  
Stochastic integration and functional limit theorems.**



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**COURSE OUTCOMES:** At the end of the course, students will be able to:

**CO1:** Acquire adequate knowledge about Continuous Time Markov chain and Queuing system.

**CO2:** Gain understanding on the Renewal process, Cumulative process and SemiMarkov process.

**CO3:** Apply different methods to solve birth and death queues. Examine the computations of renewal process and theory.

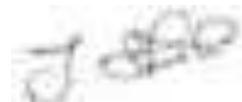
**CO4:** Conclude the idea of Branching process.

**COURSE MAPPING**  
**STOCHASTIC PROCESSES-P22MAE2A**

**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	2	2	3	2
<b>CO2</b>	2	3	3	3	2
<b>CO3</b>	3	2	2	2	3
<b>CO4</b>	3	3	2	3	2
<b>Average</b>	3	3	2	3	2

  
Signature of the HOD

## **VALUE ADDED COURSE I**

### **INTRODUCTION TO MATLAB-P22MAVAC1B**

#### **UNIT - I:**

Starting with MATLAB, MATLAB windows – Working in command window - Arithmetic operations with scalars – Display Formats - Elementary math built-in functions – Defining scalar variables - Useful commands for managing variables - Script files.

#### **UNIT - II:**

Creating Arrays – Variables - Transpose Operator - Array addressing - Adding elements to existing variables - Deleting elements - Built-in functions for handling arrays - strings and strings as variables.

#### **UNIT - III:**

Mathematical Operations with Arrays: Addition and Subtraction – Multiplication – Division - Element-by-element operations - Built-in math functions - Built-in functions for analysing arrays - Generation of random numbers.

#### **UNIT - IV:**

MATLAB workspace and the workspace window – Script file – Output commands – save and load commands – Importing and exporting commands.

#### **UNIT - V:**

plot command – fplot command - Plotting multiple graphs in the same plot – Formatting a plot – Plots with Logarithmic axes – Plots with error bars – Plots with special graphics.

#### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Programming in MATLAB

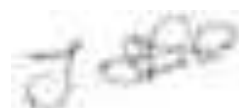
#### **COURSE OUTCOMES:**

**C01:** Understand the main features of the MATLAB development environment.

**C02:** Use the MATLAB GUI effectively.

**C03:** Design simple algorithms to solve problems.

**C04:** Write simple programs in MATLAB to solve scientific and mathematical problems.



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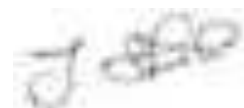
## COURSE MAPPING

### INTRODUCTION TO MATLAB-P22MAVAC1B

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	3	3	2	2
<b>CO2</b>	3	3	2	3	2
<b>CO3</b>	2	2	3	2	3
<b>CO4</b>	3	3	1	3	3
<b>Average</b>	3	3	2	3	3



Signature of the HOD

## **VALUE ADDED COURSE I**

### **INTRODUCTION TO LATEX- P22MAVAC1A**

#### **UNIT – I:**

Basic Structure of Latex 2e - Input file structure - Layout -Editors - Forward Search- Inverse Search - Compiling - Conversion to various formats.

#### **UNIT – II:**

Typesetting simple documents - sectioning - Titles- page layout -listing –enumerating - quote - letter formats.

#### **UNIT – III:**

Using package amsmath typing equations labeling and referring.

#### **UNIT – IV:**

Figure inclusion - Table inclusion.

#### **UNIT – V:**

Bibliography - Index typing - Beamer presentation Styles.

#### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Type a mathematical article using various journal style files.

#### **COURSE OUTCOMES:**

**C01:** Type their own mathematical article/notes/book/journal paper/project work.

**C02:** Meticulously prepare their own mathematical notes.

**C03:** Understand basic structure of Latex 2e and conversions of them to various formats.

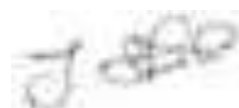
**C04:** Typeset and compile documents with titles, sectioning and enumeration etc.

**C05:** Use various style files and in particular amsmath, amsfonts, amsthm.

**C06:** Understand how to align math equations, matrices etc.

**C07:** Include the figures in various formats into their latex document and compile it successfully.

**C08:** Utilize bibtex feature of including bibliographies and indexes.



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## COURSE MAPPING

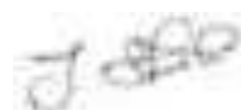
### INTRODUCTION TO LATEX-P22MAVAC1A

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO/PO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	3	2	3	2
<b>CO2</b>	3	2	2	3	2
<b>CO3</b>	3	2	3	3	3
<b>CO4</b>	3	2	3	3	3
<b>CO5</b>	3	3	2	2	3
<b>CO6</b>	3	3	3	3	3
<b>CO7</b>	3	3	3	2	3
<b>CO8</b>	3	2	3	3	3
<b>Average</b>	3	3	3	3	3



Signature of the HOD

### III SEMESTER

#### CORE COURSE VI

#### TOPOLOGY-P22MACC31

##### UNIT - I:

**Metric Spaces:** The Definition and some Examples – Open sets – Closed sets – Convergence, Completeness and Baire's theorem, Continuous mappings – Spaces of continuous functions – Euclidean and Unitary Spaces.

##### UNIT - II:

**Topological Spaces:** The Definition and some Examples – elementary concepts – open bases and open sub bases – weak topologies – The function algebra  $C(X, R)$  and  $C(X, C)$ .

##### UNIT - III:

**Compactness:** Compact spaces – Product of spaces – Tychonoff's theorem and locally compact spaces – Compactness for Metric spaces – Ascoli's theorem.

##### UNIT - IV:

**Separation:**  $T_1$ -spaces and Hausdorff spaces – Completely regular spaces and normal spaces - The Urysohn lemma and Tietze Extension Theorem - The Urysohn imbedding theorem – The Stone-Cech compactification.

##### UNIT - V:

**Connectedness and Approximation:** Connected spaces – The components of a space – Totally disconnected spaces - Local connected spaces – The Weierstrass approximation theorem – The Stone-Weierstrass theorem.

##### UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Elementary concepts from Algebraic topology.

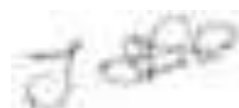
##### COURSE OUTCOMES:

**CO1:** Study and Understand the concepts of metric spaces, topological spaces

**CO2:** Understand the concepts of open bases and open sub bases

**CO3:** Understand the concepts of Compactness, connectedness and separation axioms

**CO4:** Provide patience to grapple with life outside the campus.



Signature of the HOD

**COURSE MAPPING**  
**TOPOLOGY-P22MACC31**  
**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
 If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	3	3	2	2
<b>CO2</b>	3	3	2	3	2
<b>CO3</b>	3	2	3	2	3
<b>CO4</b>	3	3	2	3	3
<b>Average</b>	3	3	3	3	3

**CORE COURSE VII**

**MEASURE THEORY AND INTEGRATION-P22MACC32**

**UNIT - I:**

**Measure on Real line:** Lebesgue outer measure - Measurable sets - Regularity  
 - Measurable function - Borel and Lebesgue measurability.

**UNIT - II:**

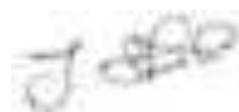
**Integration of non-negative functions:** The General integral - Integration of series - Riemann and Lebesgue integrals.

**UNIT - III:**

**Abstract Measure spaces:** Measures and outer measures - Completion of measures - Measure spaces - Integration with respect to a measure.

**UNIT - IV:**

**Convergence in Measure:** Almost uniform convergence- Signed Measures and Halin Decomposition -The Jordan Decomposition - Measurability in a Product space - The product Measure and Fubini's Theorem.



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**UNIT - V:**

**The Classical Banach spaces:** LP spaces – Minkowski and Holder’s inequality  
– Completeness – Approximation in LP spaces.

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Riesz- Markov Kakutani Theorem.

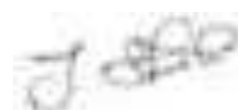
**COURSE OUTCOMES:**

- | **CO1:** Learn the basic concepts of measure and integration.
- | **CO2:** Comprehend the differences between different types of convergences.
- | **CO3:** Understand the concepts of Classical Banach Spaces
- | **CO4:** Learn completeness and approximation in  $L_p$ -spaces.
- | **CO5:** An overview of the central results of the theory of Lebesgue integration.

**COURSE MAPPING****MEASURE THEORY AND INTEGRATION-P22MACC32****CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	2	3	3	2
CO3	2	3	3	2	2
CO4	3	2	2	2	3
CO5	2	2	3	2	3
AVG	3	3	3	3	3



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**CORE CHOICE COURSE III**  
**ADVANCED NUMERICAL ANALYSIS-P22MACC3A**

**UNIT – I:**

Transcendental and polynomial equations: Rate of convergence – Secant Method, Regula Falsi Method, Newton Raphson Method, Muller Method and Chebyshev Method. Polynomial equations: Descartes' Rule of Signs - Iterative Methods: Birge-Vieta method, Bairstow's method Direct Method: Graeffe's root squaring method.

**UNIT – II:**

System of Linear Algebraic equations and Eigen Value Problems: Error Analysis of Direct methods – Operational count of Gauss elimination, Vector norm, Matrix norm, Error Estimate. Iteration methods - Jacobi iteration method, Gauss Seidel Iteration method, Successive Over Relaxation method - Convergence analysis of iterative methods, Optimal Relaxation parameter for the SOR method. Finding eigen values and eigen vectors – Jacobi method for symmetric matrices and Power methods only.

**UNIT – III:**

Interpolation and Approximation: Hermite Interpolations, Piecewise and Spline Interpolation – piecewise linear interpolation, piecewise quadratic interpolation, piecewise cubic interpolation, spline interpolation-cubic Spline interpolation. Bivariate Interpolation- Lagrange Bivariate interpolation. Least square approximation.

**UNIT – IV:**

Differentiation and Integration: Numerical Differentiation – Optimum choice of Step length – Extrapolation methods – Partial Differentiation. Numerical Integration: Methods based on undetermined coefficients - Gauss Legendre Integration method and Lobatto Integration Methods only.

**UNIT – V:**

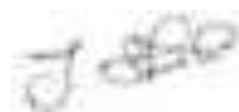
Ordinary differential equations – Singlestep Methods: Local truncation error or Discretization Error, Order of a method, Taylor Series method, Runge-Kutta methods: Explicit Runge-Kutta methods– Minimization of Local Truncation Error, System of Equations, Implicit Runge-Kutta methods. Stability analysis of single step methods (RK methods only).

**UNIT – VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Methods for partial differential equations.

**COURSE OUTCOMES:**

- **CO1:** Solve algebraic and transcendental equations using various iterative methods and study the rate of convergence of those problems.
- **CO2:** Solve System of Linear Algebraic equations using direct methods and indirect methods.



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- ⌋ **C03:** Solve eigen value problems and study the error analysis.
- ⌋ **C04:** Solve algebraic equations and differential equations using the techniques of interpolation like Lagrange Interpolation, Hermite Interpolation etc.
- ⌋ **C05:** Perform curve fitting using least square approximation.
- ⌋ **C06:** Find the numerical value of the derivative of various functions using Euler method and Runge-Kutta method.
- ⌋ **C07:** Calculate the numerical value of a definite integral using methods like quadrature rules in numerical integration.
- ⌋ **C08:** Identify the suitable numerical method and perform error analysis.



### COURSE MAPPING

#### ADVANCED NUMERICAL ANALYSIS-P22MACC3A

#### CO - PO – PSO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>C01</b>	3	3	3	3	2
<b>C02</b>	2	3	2	2	3
<b>C03</b>	3	2	3	2	3
<b>C04</b>	2	3	3	2	3
<b>C05</b>	2	3	2	3	2
<b>C06</b>	3	3	3	3	2
<b>C07</b>	2	2	2	3	3
<b>C08</b>	3	2	3	2	3
<b>Average</b>	3	3	3	3	3

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**ELECTIVE COURSE III  
COMBINATORICS-P22MAE3C**

**UNIT - I:**

Permutations and combinations - distributions of distinct objects ~ distributions of non-distinct objects - Stirlings formula.

**UNIT - II:**

Generating functions. - generating function for combinations - enumerators for permutations - distributions of distinct objects into non-distinct cells - partitions of integers – the Ferrer's graphs - elementary relations.

**UNIT - III:**

Recurrence relation - linear recurrence relations with constant coefficients solutions by the technique of generating functions - a special class of nonlinear difference equations - recurrence relations with two indices.

**UNIT - IV:**

The principle of inclusion and exclusion - general formula - permutations with restriction on relative positions - derangements - the rook polynomials - permutations with forbidden positions.

**UNIT - V:**

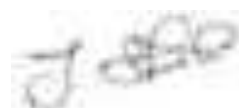
Polya's theory of counting - equivalence classes under a permutation group Burnside theorem - equivalence classes of functions - weights and inventories of functions - Polya's fundamental theorem – generation of Polya's theorem.

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Catalan numbers and their generalizations & partitions.

**Course Outcomes:**

- | **C01:** Review and explain the techniques required in addressing problems on permutations and combinations. For illustration, finding how the distribution of distinct objects into non distinct cells are made helps the students to gain the impetus of the subject.
- | **C02:** Explain how the technique of generating functions and recurrence functions are used to solve the problems in combinatorics.
- | **C03:** Detail about simultaneous recurrences and use it to solve more problems.

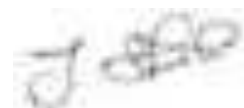


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**COURSE MAPPING**  
**COMBINATORICS-P22MAE3C**  
**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>C01</b>	2	2	2	3	3
<b>C02</b>	2	3	2	3	3
<b>C03</b>	3	2	2	3	2
<b>AVERAGE</b>	2	2	2	3	3



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## **VALUE ADDED COURSE II**

### **MATHEMATICS FOR COMPETITIVE EXAMINATIONS-P22MAVAC2A**

#### **UNIT – I:**

Problems on Numbers- Average-Problems on Ages.

#### **UNIT – II:**

Percentage-Profit & Loss-Simple Interest-Compound Interest.

#### **UNIT – III:**

Ratio & Proportion-Partnership-Calender-Clocks.

#### **UNIT – IV:**

Time and work-Pipes & Cistern.

#### **UNIT – V:**

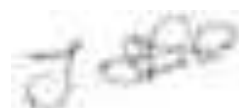
Time & Distance-Problems on Trains-Boats and Streams.

#### **UNIT – VI: CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Simple problems using sets, functions, group theory etc.

#### **COURSE OUTCOMES:**

- ☐ **C01:** Face competitive examinations with confidence.
- ☐ **C02:** Solve a lot of problems on numbers and averages and problems on ages.
- ☐ **C03:** Get a lot of training on percentage, profit and loss.
- ☐ **C04:** Crack problems on calculating simple interest and compound Interest.
- ☐ **C05:** Work on a plenty of problems on time and work.
- ☐ **C06:** Get working knowledge on ratios and proportions.
- ☐ **C07:** Calculate time, distance, speed given the other two and solve lot of problems.
- ☐ **C08:** Acquire problem solving ideas on trains, boats and streams.



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## COURSE MAPPING

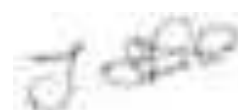
### MATHEMATICS FOR COMPETITIVE EXAMINATIONS-P22MAVAC2A

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>C01</b>	3	2	3	2	2
<b>C02</b>	2	3	2	2	3
<b>C03</b>	3	2	3	2	3
<b>C04</b>	2	3	3	2	3
<b>C05</b>	2	3	2	3	2
<b>C06</b>	3	3	3	3	2
<b>C07</b>	2	2	2	3	3
<b>C08</b>	3	2	3	2	3
<b>Average</b>	3	3	3	3	3



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## IV SEMESTER

### CORE COURSE VIII

#### Semester: IV FUNCTIONAL ANALYSIS

**UNIT – I:** Banach Spaces: The definition and some examples – Continuous linear transformations – The Hahn-Banach theorem.

**UNIT – II:** Banach Spaces: The natural embedding of  $N$  in  $N^{**}$  – The open mapping theorem – The conjugate of an operator.

**UNIT – III:** Hilbert Spaces: The definition and some simple properties – Orthogonal complements – Orthonormal sets – The conjugate space  $H^*$ .

**UNIT – IV:** Hilbert Spaces: The adjoint of an operator – Self-adjoint operators – Normal and unitary operators – Projections.

**UNIT – V:** General Preliminaries on Banach Algebras: The Definition and some examples – Regular and singular elements – Topological divisors of zero – The spectrum – The formula for the spectral radius – The radial and semi-simplicity.

**UNIT – VI** CURRENT CONTOURS (For Continuous Internal Assessment Only): Generating topologies -Weak and Weak Topologies - Banach-Alaoglu Theorem.

#### COURSE OUTCOMES:

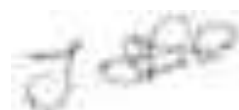
**CO1** Identify Banach spaces and analyse their properties with other types of spaces.

**CO2** Examine and identify properties of complex Banach spaces- Hilbert spaces.

**CO3** Apply the analytical techniques and theoretical knowledge in Hilbert Spaces.

**CO4** Findout and determine orthonormal sets. Explain various properties of Hilbert spaces.

**CO5** Attain knowledge and experience of working with many pure mathematical problems.



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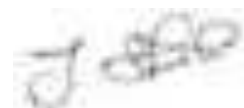
## COURSE MAPPING

### FUNCTIONAL ANALYSIS -P22MACC41

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3
CO2	2	3	2	3	2
CO3	3	2	2	2	2
CO4	2	3	3	2	2
CO5	2	3	3	2	2
AVG	3	3	3	2	2



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## CORE COURSE IX

### DIFFERENTIAL GEOMETRY- P22MACC42

#### UNIT – I:

**Space Curves:** Definition of a space curve - Arc length - tangent - normal and binormal - curvature and torsion - contact between curves and surfaces- tangent surface- involutes and evolutes- Intrinsic equations - Fundamental Existence Theorem for space curves- Helics.

#### UNIT – II:

**Intrinsic Properties of a Surface:** Definition of a surface - curves on a surface - Surface of revolution - Helicoids - Metric- Direction coefficients - families of curves- Isometric correspondence- Intrinsic properties.

#### UNIT – III:

**Geodesics:** Geodesics - Canonical geodesic equations - Normal property of geodesics- Existence Theorems - Geodesic parallels - Geodesics curvature- Gauss- Bonnet Theorem - Gaussian curvature- surface of constant curvature.

#### UNIT – IV:

**Non Intrinsic Properties of a Surface:** The second fundamental form- Principal curvature - Lines of curvature - Developable – Developable associated with space curves and with curves on surface - Minimal surfaces - Ruled surfaces.

#### UNIT – V:

**Differential Geometry of Surfaces:** Compact surfaces whose points are umbilics- Hilbert's lemma - Compact surface of constant curvature - Complete surface and their characterization - Hilbert's Theorem - Conjugate points on geodesics.

#### UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

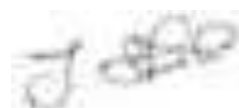
Elementary concepts from commutative algebra. The Gauss Bonet theorems.

### Course Outcome

**CO1:** Have a solid understanding of the subjects, linear algebra, multivariable calculus and differential equations and a basic knowledge of theoretical physics.

**CO2:** Sketch and workout graphs, level sets, tangent space and surfaces of given smooth maps.

**CO3:** Good knowledge on calculus of vector fields.



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**CO4:** Understand how Gauss map helps to identify the surfaces that are mapped onto the unit n-sphere.

**CO5:** Describe surfaces as a solution sets of differential equations.

**CO6:** Exhibit geodesics on surfaces.

**CO7:** Learn how parametrizations of plane curves can be used to evaluate integrals over the curve.

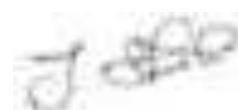
**CO8:** Compute the Gaussian curvature of various surfaces.

**COURSE MAPPING  
DIFFERENTIAL GEOMETRY-P22MACC42**

**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3
CO2	3	2	3	3	3
CO3	2	1	3	1	1
CO4	2	2	3	2	2
CO5	3	2	2	1	2
CO6	3	3	1	2	3
<b>CO7</b>	2	3	3	3	3
<b>CO8</b>	3	2	3	2	3
AVERAGE	3	2	3	2	3



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## **CORE COURSE X**

### **FLUID DYNAMICS-P22MACC43**

#### **UNIT – I:**

Real Fluids and Ideal Fluids - Velocity of a Fluid at a point – Streamlines and Path lines: Steady and Unsteady Flows – The Velocity potential – The Vorticity vector – Local and Particle Rates of Change – The Equation of continuity – Worked examples – Acceleration of a Fluid – Conditions at a rigid boundary – General analysis of fluid motion – Pressure at a point in a Fluid at Rest – Pressure at a point in Moving Fluid – Conditions at a Boundary of Two Inviscid Immiscible Fluids – Euler's equation of motion – Bernoulli's equation – Worked examples.

#### **UNIT – II:**

Discussions of a case of steady motion under conservative body forces – Some potential theorems – Some Flows Involving Axial Symmetry – Some special two-Dimensional Flows-Impulsive Motion. Some three- dimensional Flows: Introduction – Sources, Sinks and Doublets – Images in a Rigid infinite Plane – Axi-Symmetric Flows; Stokes stream function.

#### **UNIT – III:**

Some Two- Dimensional Flows: Meaning of a Two- Dimensional Flow – Use of cylindrical polar co-ordinates – The stream function – The Complex Potential for Two-Dimensional, Irrotational, Incompressible Flow – complex velocity potentials for Standard Two Dimensional Flows – Some worked examples – The Milne- Thomson circle theorem and applications – The theorem of Blasius.

#### **UNIT – IV:**

The use of conformal Transformation and Hydro dynamical Aspects – Vortex rows. Viscous flow Stress components in a real fluid - relations between Cartesian components of stress - Translational Motion of Fluid element – The Rate of Strain Quadratic and Principle Stresses – Some further properties of the rate of strain quadratic - Stress analysis in fluid motion – Relations between stress and rate of strain - The coefficient of viscosity and laminar flow – The Navier- Stokes equations of motion of a viscous fluid.

#### **UNIT – V:**

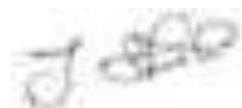
Some solvable problems in viscous flow – Steady viscous flow in tubes of uniform cross section – Diffusion of vorticity – Energy Dissipation due to viscosity – Steady Flow past a Fixed Sphere – Dimensional Analysis; Reynolds Number – Prandtl's Boundary Layer.

#### **UNIT – VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Gas Dynamics and Magneto hydrodynamics.

#### **COURSE OUTCOMES:**

- **CO1:** Understand the basic ideas of fluid velocity, streamlines and rotational and irrotational flows.



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- ⌌ **CO2:** Understand the meanings of fundamental terms like pressure and body force.
- ⌌ **CO3:** Develop special mathematical methods involving images and complex variables for incompressible fluids.
- ⌌ **CO4:** Derive images in three dimension.
- ⌌ **CO5:** Solve problems using Milne-Thomson circle theorem.
- ⌌ **CO6:** Understand Navier's stokes of motion
- ⌌ **CO7:** Unify many developed principles.
- ⌌ **CO8:** Solve problems related with cosmic electrodynamics and nuclear engineering.

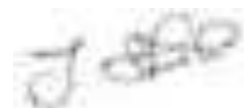
### COURSE MAPPING

#### FLUID DYNAMICS-P22MACC43

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put "-"

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>C01</b>	2	3	3	2	2
<b>C02</b>	3	2	2	3	2
<b>C03</b>	3	3	2	2	2
<b>C04</b>	3	3	3	3	3
<b>C05</b>	3	2	2	3	2
<b>C06</b>	2	3	3	2	2
<b>C07</b>	3	2	2	3	2
<b>C08</b>	3	3	3	3	3
<b>AVE</b>	3	3	3	3	2



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## **ELECTIVE COURSE IV**

### **THEORY OF PROBABILITY-P22MAE4A**

#### **UNIT - I:**

**Fields and  $\sigma$  Fields:** Class of events –Functions and Inverse functions – Random variables – Limits of random variables.

#### **UNIT - II:**

**Probability Space:** Definition of probability – some simple properties – discrete probability space – General probability space – Induced probability space.

#### **UNIT - III:**

**Distribution functions:** Distribution functions of a random variable – Decomposition of distributive functions-Distributive functions of vector random variables – Correspondence theorem.

#### **UNIT - IV:**

**Expectation and Moments:** Definition of Expectation –Properties of expectation – Moments, Inequalities.

#### **UNIT - V:**

**Convergence of Random Variables:** Convergence in Probability – Convergence almost surely – Convergence in distribution –Convergence in the rthmean - Convergence theorems for Expectations.

#### **UNIT - VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Usage of package R, Measure theoretic introduction to probability theory.

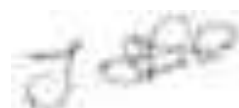
### **COURSE OUTCOMES:**

**At the end of the course, students will be able to:**

**CO1:** Understand Probability axioms and find conditional probabilities for lot of cases

**CO2:** Compute expectations and moments on a number of distributions.

**CO3:** Gain mastery in the important probability distributions, viz., Binomial, Poisson and Normal.



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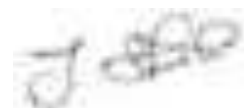
## COURSE MAPPING

### THEORY OF PROBABILITY-P22MAE4A

#### CO - PO – PSO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5
<b>C01</b>	3	3	3	2	2
<b>C02</b>	3	3	2	2	2
<b>C03</b>	3	3	3	2	3
<b>AVE</b>	3	3	3	2	2



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## SHRIMATI INDIRA GANDHI COLLEGE

(Nationally Accredited at 'A' Grade (3<sup>rd</sup> Cycle) by NAAC)

TIRUCHIRAPPALLI-620 002

### PG & RESEARCH DEPARTMENT OF MATHEMATICS

#### B.Sc., Mathematics

#### PROGRAMME LEARNING OBJECTIVES:

1. To have a comprehension of the instruments required to have the option to quantitatively examine and comprehend the common and social world,
2. To be able to take care of issues, think scientifically, and reason quantitatively.
3. To be able to get to and convey Mathematical data.
4. To take an interest effectively in Mathematics related occasions in particular Conferences/Seminars/Workshops and Quiz programs.

#### PROGRAMME OUTCOMES:

**PO1: Area information:** Demonstrate information on essential ideas, standards and uses of the particular science discipline.

**PO2: Logical and Technical Skills:** Ability to deal with/utilize suitable apparatuses/strategies/gear with a comprehension of the standard working methods, wellbeing perspectives/impediments.

**PO3: Basic reasoning and Problem settling:** Identify and basically break down appropriate issues in the important order utilizing proper instruments and strategies just as ways to deal with coming to feasible end results/arrangements.

**PO4: Individual and collaboration:** Exhibit the possibility to successfully achieve assignments freely and as a part or pioneer in various groups, and in multidisciplinary settings.

**PO5: Powerful Communication:** Communicate successfully in spoken and composed structure just as through electronic media with mainstream researchers just as with society on the loose.

**PO6: Society:** Analyse the effect of logical and innovative advances on nature and society and the requirement for reasonable improvement.

**PO7: Morals:** Commitment to proficient morals and duties.

**PO8: Deep-rooted learning:** Ability to participate in long-lasting learning with regard to the fast advancements in the control.

#### PROGRAMME SPECIFIC OUTCOMES:



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**PSO1:** Explicate the concepts of pure and applied Mathematics by demonstrating the knowledge and understanding of the mathematical principles in multidisciplinary environments.

**PSO2:** Demonstrate a computational ability in solving a wide array of mathematical problems.

**PSO3:** Utilize mathematical skills of the logical and scientific approach.

**PSO4:** Appreciate the beauty of Mathematics with the attainment of proficiency in problem solving, computational skills, critical thinking, technical and quantitative reasoning.

## I SEMESTER

### CORE COURSE I

#### DIFFERENTIAL CALCULUS AND TRIGONOMETRY-22SCCMM1

##### UNIT – I:

Functions and Limits: Constants and variables – Functions – Classification of functions - Limits.

##### UNIT – II:

Methods of Successive Differentiation – Leibnitz's Theorem and its applications- Increasing & Decreasing functions –Maxima and Minima of functions of two variables.

##### UNIT – III:

Curvature – Radius of curvature in Cartesian and Polar Coordinates – Centre of curvature– Radius of curvature – Evolutes& Involutives

##### UNIT – IV:

Expansions of  $\sin(nx)$ ,  $\cos(nx)$ ,  $\tan(nx)$ – Expansions of  $\sin^n x$ ,  $\cos^n x$  –Expansions of  $\sin(x)$ ,  $\cos(x)$ ,  $\tan(x)$  in powers of  $x$ .

##### UNIT – V:

Hyperbolic functions – Relation between hyperbolic & Circular functions- Inverse hyperbolic functions.

##### UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

The Double angle formulas and The Half-angles identities.



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## Course Outcome

**CO1:** Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point.

**CO2:** Compare and contrast the ideas of continuity and differentiability.

**CO3:** Find maxima, minima, critical points and inflection points of functions and to determine the concavity of curves.

**CO4:** Convert angles from degrees to radians and vice versa.

**CO5:** Compute the length of a circular arc given the radius and the interior angle.

**CO6:** Understand the definitions of the inverse trigonometric functions, compute the domain and range of the hyperbolic and inverse trigonometric functions and to find exact values of composite functions with inverse trigonometric functions.


## DIFFERENTIAL CALCULUS AND TRIGONOMETRY - 22SCMM1 - MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	3	2	2	2	3
<b>CO2</b>	3	3	3	3	3	2	2	3
<b>CO3</b>	3	2	2	3	2	3	2	3
<b>CO4</b>	3	3	2	3	2	2	2	3
<b>CO5</b>	3	3	2	3	2	2	1	2
<b>CO6</b>	3	3	3	2	3	2	1	3
<b>Average</b>	3	3	3	3	2	2	2	3

  
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## **CORE COURSE II**

### **INTEGRAL CALCULUS AND FOURIER SERIES - 22SCCMM2**

#### **UNIT – I:**

Definite integrals - Integration by parts and reduction formulae.

#### **UNIT – II:**

Geometric Application of Integration-Area under plane curves: Cartesian co- ordinates -Area of a closed curve - Examples - Areas in polar co-ordinates.


#### **UNIT – III:**

Double integrals – changing the order of Integration – Triple Integrals.

#### **UNIT – IV:**

Beta and Gamma functions and the relation between them –Integration using Beta and Gamma functions.

#### **UNIT – V:**



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Fourier series- definition - Fourier Series expansion of periodic functions with Period  $2\pi$  – Use of odd & even functions in Fourier Series. Half-range Fourier Series – Development in Cosine series – Development in Sine series.

**UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):**

Chemical, Physical and Biomedical Applications of Fourier series.

**Course Outcome**

**CO1:** Derive reduction formula and thereby evaluate some standard integrals.

**CO2:** Explain the properties of Beta and Gamma functions and apply it to compute the integral.

**CO3:** Identify odd and even functions and determine Fourier series expansion of these given functions.

**CO4:** Apply change of variable method to evaluate double integral.

**CO5:** Utilize double and triple integral to compute area and volume of a solid.

**INTEGRAL CALCULUS AND FOURIER SERIES - 22SCMM2 - MAPPING**

**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	2	2	2	2	2	2	2
<b>CO2</b>	3	2	2	3	2	2	3	2
<b>CO3</b>	2	2	2	3	2	2	2	2
<b>CO4</b>	2	2	2	2	2	3	2	3
<b>CO5</b>	2	2	2	2	2	3	2	2
<b>Average</b>	2	2	2	2	2	2	2	2

  
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## II SEMESTER

### CORE COURSE III

#### DIFFERENTIAL EQUATIONS - 22SCCMM3

##### UNIT – I:

Equations of the first order and first degree – Variable separable – Homogeneous, Non-homogeneous, Linear equations – Bernoulli's equation – Exact differential equations: Sufficient condition for exact differential equations – Practical rules for solving exact differential equations.

##### UNIT – II:

First order, higher degree differential equations – Equations solvable for  $dy/dx$ , solvable for  $y$ , solvable for  $x$ , Clairaut's form – Homogeneous equations in  $x$  and  $y$  – simple problems.

##### UNIT – III:

Particular integrals of second order differential equations with constant coefficients - Linear equations with variable coefficients – Method of Variation of Parameters (Omit third & higher order equations).

##### UNIT – IV:

Formation of Partial Differential Equation – General, Particular & Complete integrals – Solution of PDE of the standard forms - Lagrange's method - Charpit's method and few standard forms.

##### UNIT – V:

PDE of second order homogeneous equation with Constant coefficients – Particular integrals of the forms  $e^{ax+by}$ ,  $\sin(ax+by)$ ,  $\cos(ax+by)$ ,  $x^r y^s$  and  $e^{ax+by}.f(x,y)$ .

##### UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Moving Boundary Value Problems



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## Course Outcome

**CO1:** Solve first-order ordinary differential equations.

**CO2:** · Solve higher order differential equations.

**CO3:** · Solve the Higher order differential equations using methods of variation of parameter.

**CO4:** · Solve partial differential equations using Lagrange's Method.


## DIFFERENTIAL EQUATIONS - 22SCCMM3 - MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	2	2	2	3	2	2	2	2
<b>CO2</b>	3	3	3	2	2	2	2	3
<b>CO3</b>	3	3	3	3	2	3	2	2
<b>CO4</b>	2	2	3	2	2	2	2	3
<b>Average</b>	2	3	3	3	2	2	2	3

  
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## **CORE COURSE IV**

### **ANALYTICAL GEOMETRY 3D - 22SCCMM4**

#### **UNIT – I:**

Symmetrical form of equation of a straight line – Equation of a straight line passing through two given points – Condition for a line to be parallel to a plane – Angle between a plane and a line – Condition for two straight lines to be coplanar – Shortest Distance between two given lines.

#### **UNIT – II:**

Sphere – Equation of a sphere when the centre and radius are given – Plane section of a sphere – Equation of a circle – Intersection of two spheres – The equation of a tangent plane to a sphere.

#### **UNIT – III:**

Equation of a surface – Cone – Right Circular cone – Intersection of a straight line and quadric cone – Tangent plane and normal.

#### **UNIT – IV:**

Condition for a plane to touch a quadric cone - angle between lines in which a plane cuts a cone – Condition that a cone has three mutually perpendicular generators.

#### **UNIT – V:**

Central quadrics – intersection of a line and a quadric – tangents and tangent planes – condition for a plane to touch a conicoid.

#### **UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):**

An Introduction to Geo Gebra software.

#### **Course Outcome**

**CO1:** Gain knowledge about the regular geometrical figures and their properties.

**CO2:** Analyze condition of tangency and find the tangent plane to the sphere.

**CO3:** Examine the condition for the general equation of the cone.

**CO4:** Understand the concept of quadric cone and its properties.

**CO5:** Acquire the basic knowledge of tangents and conicoid



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## ANALYTICAL GEOMETRY 3D - 22SCCMM4 - MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	2	2	3	2	3
<b>CO2</b>	3	2	2	3	2	3	2	3
<b>CO3</b>	3	3	3	3	3	2	3	3
<b>CO4</b>	3	3	3	3	3	2	3	3
<b>CO5</b>	3	3	3	3	3	3	3	3
<b>Average</b>	3	3	3	3	2	2	2	3

  
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### III SEMESTER

#### CORE COURSE V

#### CLASSICAL ALGEBRA AND THEORY OF NUMBERS - 22SCCMM5

##### UNIT - I:

Relation between roots & coefficients of Polynomial Equations - Symmetric functions - Sum of the  $r^{\text{th}}$  Powers of the Roots

##### UNIT - II:

Newton's theorem on the sum of the power of the roots-Transformations of Equations - Diminishing, Increasing & Multiplying the roots by a constant - Reciprocal equations - To increase or decrease the roots of an equation by a given quantity.

##### UNIT - III:

Form of the quotient and remainder - Removal of terms - To form an equation whose roots are of any power - Transformation in general - Descarte's rule of sign.

##### UNIT - IV:

Inequalities - elementary principles - Geometric & Arithmetic means - Weirstrass inequalities - Cauchy inequality - Applications to Maxima & Minima.

##### UNIT - V:

Theory of Numbers - Prime & Composite numbers - divisors of a given number  $N$  - Euler's Function  $\phi(N)$  and its value - The highest Power of a prime  $P$  contained in  $N!$  - Congruences - Fermat's, Wilson's & Lagrange's Theorems.


##### UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Linear Diophantine equation

#### Course Outcome

**CO1:** Know the foundation of Theory of Equations.

**CO2:** Applying the skills to solve problems in operative algebra.

  
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**CLASSICAL ALGEBRA AND THEORY OF NUMBERS - 22SCCMM5 - MAPPING**

**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	2	3	2	3	2
<b>CO2</b>	3	3	2	2	2	3	1	3
<b>Average</b>	3	3	3	2	3	3	2	3



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## CORE COURSE VI

### SEQUENCES AND SERIES-22SCMM6

#### UNIT - I:

Sequences - Bounded Sequences - Monotonic Sequences-  
Convergent Sequences - Divergent Sequences - Oscillating sequences

#### UNIT - II:

Algebra of Limits - Behavior of Monotonic functions

#### UNIT - III:

Some theorems on limits - subsequences - limit points - Cauchy sequences.

#### UNIT - IV:

Series - infinite series - Cauchy's general principal of convergence - Comparison-  
test theorem and test of convergence using comparison test (comparison test  
statement only, no proof).

#### UNIT - V:

Test of convergence using d'Alembert's ratio test - Cauchy's root test - Alternating  
Series - Absolute Convergence (Statement only for all tests).

#### UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

An introduction Power series.

#### Course Outcome

**CO1:** Determine if an infinite sequence is bounded

**CO2:** Determine if an infinite sequence is monotonic

**CO3:** Determine if an infinite sequence is convergent or divergent.

**CO4:** Find the sequence of partial sums of an infinite series.

**CO5:** Determine if a geometric series is convergent or divergent.



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## SEQUENCES AND SERIES-22SCCMM6- MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	2	2	2	2	2	1	1
<b>CO2</b>	3	3	3	2	1	1	1	1
<b>CO3</b>	3	2	2	2	2	2	1	1
<b>CO4</b>	3	3	3	2	1	1	1	1
<b>CO5</b>	3	2	1	1	1	-	-	1
<b>Average</b>	3	2	2	2	1	1	1	1

  
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## IV SEMESTER

### CORE COURSE VII

#### VECTOR CALCULUS AND LAPLACE TRANSFORMS - 22SCCMM7

##### UNIT - I:

Vector differentiation –velocity & acceleration-Vector & scalar fields – Gradient of a vector- Directional derivative – divergence & curl of a vector solinoidal & irrotational vectors – Laplacian double operator –simple problems.

##### UNIT - II:

Vector integration –Tangential line integral –Conservative force field –scalar potential-Work done by a force - Normal surface integral- Volume integral – simple problems.

##### UNIT - III:

Gauss Divergence Theorem – Stoke’s Theorem- Green’s Theorem – Simple problems and Verification of the theorems for simple problems.

##### UNIT - IV:

Laplace Transforms – Standard formulae – Laplace transform of Periodic functions – Some general theorems & simple applications.

##### UNIT - V:

Inverse Laplace Transforms – Use of Laplace Transforms in solving ODE with constant coefficients.

##### UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Z Transforms

#### Course Outcome

**CO1:** Learn the basic knowledge of vector differentiation and vector integrating

**CO2:** Solve vector differentiation and integration problems.

**CO3:** Introduce the basic concepts of Laplace Transforms.

**CO4:** Solve a differential equation by using Laplace Transforms.



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## VECTOR CALCULUS AND LAPLACE TRANSFORMS - 22SCCMM7 - MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	3	3	2	2	3
<b>CO2</b>	3	3	3	3	2	3	2	3
<b>CO3</b>	3	2	2	3	2	2	2	3
<b>CO4</b>	3	3	2	3	2	2	2	2
<b>Average</b>	3	3	3	3	2	2	2	3



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## **CORE COURSE VIII**

### **ABSTRACT ALGEBRA - 22SCCMM8**

#### **UNIT - I:**

Groups: Definition and Examples – Elementary Properties of a Group – Equivalent Definitions of a Group.-Permutation Groups.

#### **UNIT - II:**

Subgroups – Cyclic Groups – Order of an Element – Cosets and Lagrange's Theorem.

#### **UNIT - III:**

Normal Subgroups and Quotient Groups - Isomorphism –Homomorphism.

#### **UNIT - IV:**

Rings: Definitions and Examples - Elementary properties of rings – Isomorphism - Types of rings.-Characteristic of a ring – subrings – Ideals - Quotient rings.

#### **UNIT - V:**

Maximal and Prime Ideals - Homomorphism of rings – Field of quotient of an integral domain – unique factorization domain – Euclidean domain.

#### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Polynomial rings

#### **Course Outcome**

**CO1:** Demonstrate the abstract structures of algebra.

**CO2:** Prove standard theorems of groups and rings.

**CO3:** Check the irreducibility of the polynomial and verify whether a function is an isomorphism or not.

**CO4:** Determine cosets, automorphism, kernel, maximal and prime ideals.

**CO5:** Develop examples of groups and rings with specific criterions.



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## ABSTRACT ALGEBRA - 22SCCMM8- MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	2	3	2	3	3	3	3	-
<b>CO2</b>	3	3	2	3	3	3	2	2
<b>CO3</b>	2	3	2	2	3	3	-	3
<b>CO4</b>	2	3	2	3	2	3	3	3
<b>CO5</b>	2	3	2	2	2	3	2	2
<b>Average</b>	2	3	2	3	3	3	2	2



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## V SEMESTER

### CORE COURSE IX

#### NUMERICAL METHODS AND MATLAB-22SCCM9

##### UNIT - I:

MATLAB Environment: Getting Started – Solving Problems in MATLAB – Saving your works – Predefined MATLAB Functions – Using Predefined Functions – Manipulating Matrices – Computational Limitations-Special Values and Functions.

##### UNIT - II:

Plotting: Introduction to Two Dimensional Plotting – Three Dimensional Plotting – Editing Plots from the Menu Bar – Creating Plots from the Workshop Window. Programming in MATLAB: Introduction – Problems with Two Variables – Input/Functions – Statement level Control Structures.

##### UNIT - III:

Numerical Techniques: Introduction – Curve Fitting: Linear and Polynomial Regression – Using the Interactive Fitting Tools – Numerical Integration – Numerical Differentiation.

##### UNIT - IV:

Curve Fitting – Fitting Linear and parabolic curves by the method of least squares principles Solving algebraic and transcendental equations-Bisection method, false position method and Newton Raphson method – Solving simultaneous algebraic equations – Guass-seidal method – Guass elimination method.

##### UNIT - V:

Interpolation – Newton's forward and backward difference formulae – Lagrange's interpolation formula – Numerical integrations using Trapezoidal and Simpson's one – third rules – solution of ODE's – Euler method and Runge-Kutta fourth order method.

##### UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Error analysis of Numerical Methods



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## Course Outcome

**CO1:** Understanding the exciting world of programming through MATLAB.

**CO2:** Know the techniques of Numerical Methods.

**CO3:** Apply the MATLAB programming to solve numerical problems. convergent geometric series.

## NUMERICAL METHODS AND MATLAB-22SCMM9- MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3	3	3	3
<b>CO3</b>	1	1	1	1	1	3	3	3
<b>Average</b>	3	3	3	3	3	3	3	3



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## CORE COURSE X

### REAL ANALYSIS-22SCMM10

#### UNIT – I:

Introduction – Sets and functions – Countable and Uncountable sets – Inequalities of Holder and Minkowski – Metric spaces – Definition and Examples – Bounded sets in a metric space – Open Ball in a Metric space – Open sets.

#### UNIT – II:

Subspace – Interior of a set – Closed sets – Closure – Limit point – Dense sets – Completeness – Baire's Category theorem.

#### UNIT – III:

Continuity – Homeomorphism – Uniform Continuity.

#### UNIT – IV:

Connectedness – Definition and examples – Connected subsets of  $\mathbb{R}$  – Connectedness & Continuity.

#### UNIT – V:


Compact Metric spaces – Compact subsets of  $\mathbb{R}$  – Equivalent Characterization for Compactness – Compactness and Continuity.

#### UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Introduction to Basic topology

#### Course Outcome

- CO1:** Explain the concepts such as real valued functions, continuity, connectedness, compactness, etc.
- CO2:** Prove standard theorems in real analysis.
- CO3:** Distinguish between upper bound and lower bound; continuity and uniform continuity of a function; limit point and interior point; and bounded and totally bounded.
- CO4:** Characterize structures of connected sets, nowhere dense sets, continuity of a function, compact sets and category of set. Generate sets and functions of required nature.



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## REAL ANALYSIS-22SCCMM10- MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	2	2	1	-	1	1
<b>CO2</b>	3	3	2	2	1	-	1	1
<b>CO3</b>	3	2	3	1	-	1	1	1
<b>CO4</b>	3	2	3	1	-	1	1	1
<b>Average</b>	3	3	3	2	1	1	1	1



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## **CORE COURSE XI**

### **STATICS-22SCCMM11**

#### **UNIT – I:**

Introduction – Forces acting at a point: Triangle of forces – Resolving of a force – Condition of equilibrium.

#### **UNIT – II:**

Parallel forces and Moments: Resultant of parallel forces – Theorems on Moments – Moment about an axis – couples.

#### **UNIT – III:**

Equilibrium of three forces acting on a rigid body: Conditions of equilibrium – Trigonometrical theorems and problems - Coplanar forces: Reduction of Coplanar forces

– Equation of Line of action of the resultant – Conditions of equilibrium.

#### **UNIT – IV:**

Friction: Introduction – Laws of Friction – Definitions – Equilibrium of a particle on a rough inclined plane.

#### **UNIT – V:**

Equilibrium of strings: Equation of the Common Catenary -Parabolic

Catenary. **UNIT – VI CURRENT CONTOURS (For Continuous Internal**

**Assessment Only):** Introduction to Virtual work

### **Course Outcome**

**CO1:**The course deals with the study of internal and external forces in a structure.

**CO2:** Provide the basic knowledge of Equilibrium of a particle.

**CO3:** Develop a working knowledge to handle practical problems.



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## STATICS-22SCMM11- MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	2	3	1	2	1	2
<b>CO2</b>	3	3	3	2	2	2	2	2
<b>CO3</b>	3	3	3	2	2	2	2	3
<b>Average</b>	3	3	3	2	2	2	2	3

  
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## CORE PRACTICAL I

### MATLAB PROGRAMMING LAB:22SCMM1P

#### LIST OF PRACTICALS

1. Linear Interpolation
2. Linear Regression
3. Curve Fitting
4. Trapezoidal rule of Integration
5. Simpson's 1/3 rule of Integration
6. Newton – Raphson method of solving equations
7. Gauss Elimination method of solving simultaneous equations
8. Gauss – Seidal method of solving simultaneous equations
9. R-K fourth order method of solving differential equations
10. Lagrange's method of interpolation

#### COURSE OUTCOME

**CO1:** Experience the programming skills through numerical methods.

**CO2:** Know basic commands in MATLAB programming.

**CO3:** Solve numerical problems using MATLAB programming.


#### MATLAB PROGRAMMING LAB:22SCMM1P- MAPPING

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	3	3	3	1	1
<b>CO2</b>	3	3	3	3	3	2	2	2
<b>CO3</b>	3	3	3	3	3	3	3	3
<b>Average</b>	3	3	3	3	3	3	3	3

  
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## MAJOR BASED ELECTIVE I

### OPERATIONS RESEARCH-22SMBEMM1A

#### UNIT – I:

Linear programming problem - Mathematical formulation – Illustrations on Mathematical formulation on Linear Programming Problems – Graphical solution method - some exceptional cases - Canonical and standard forms of Linear Programming Problem - Simplex method.

#### UNIT – II:

Use of Artificial Variables (Big M method - Two phase method) – Duality in Linear Programming - General primal-dual pair - Formulating a Dual problem - Primal- dual pair in matrix form -Dual simplex method.

#### UNIT – III:

Transportation problem - LP formulation of the TP - Solution of a TP - Finding an initial basic feasible solution (NWCM - LCM -VAM) – Degeneracy in TP - Transportation Algorithm (MODI Method) - Assignment problem - Solution methods of assignment problem – special cases in assignment problem.

#### UNIT – IV:

Queuing theory - Queuing system - Classification of Queuing models - Poisson Queuing systems Model I (M/M/1)( $\infty$ /FIFO) only - Games and Strategies – Two person zero sum - Some basic terms - the maximin-minimax principle - Games without saddle points-Mixed strategies - graphic solution  $2 \times n$  and  $m \times 2$  games.

#### UNIT – V:

PERT and CPM – Basic components – logical sequencing - Rules of network construction- Critical path analysis - Probability considerations in PERT


**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):** Applications of OR in Financial Management, Budgeting and Investments

#### Course Outcome

**CO1:** Demonstrate the basic concepts of LPP, game theory, queuing models and networks.

**CO2:** Make use of different methods to get optimality in LPP, TP, AP and games.

**CO3:** Check the existence of alternate / infeasible / unbounded solutions.

  
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**CO4:** Evaluate the solution of primal using duality, optimal solution by characteristics of queuing system.

**CO5:** Convert possible real life problems into OR models.


**OPERATIONS RESEARCH-22SMBEMM1A- MAPPING**

**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	2	2	3	2	-	2
<b>CO2</b>	2	3	3	2	3	-	2	3
<b>CO3</b>	2	3	3	2	3	3	3	-
<b>CO4</b>	2	3	2	3	3	2	2	2
<b>CO5</b>	2	3	3	2	2	3	2	3
<b>Average</b>	2	3	3	2	3	2	2	2

  
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## **SKILL BASED ELECTIVE I**

### **INTRODUCTION TO LATEX:22SBEMM1**

#### **UNIT - I:**

Basic Structure of Latex 2e - Input file structure - Layout -Editors - Forward Search - Inverse Search - Compiling - Conversion to various formats.

#### **UNIT - II:**

Typesetting simple documents - sectioning - Titles- page layout - listing – enumerating - quote - letter formats.

#### **UNIT - III:**

Using package amsmath typing equations labeling and referring.

#### **UNIT - IV:**

Figure inclusion - Table inclusion.

#### **UNIT - V:**

Bibliography - Index typing - Beamer presentation Styles.

#### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment**

**Only):** Type a mathematical article using various journal style files

#### **Course Outcome**

**CO1:** Type their own mathematical article/notes/book/journal paper/project work.

**CO2:** Meticulously prepare their own mathematical notes.

**CO3:** Understand basic structure of Latex 2e and conversions of them to various formats.

**CO4:** Typeset and compile documents with titles, sectioning and enumeration etc.

**CO5:** Use various style files and in particular amsmath, amsfonts,amsthm.

**CO6:** Understand how to align math equations, matrices etc

**CO7:** Include the figures in various formats into their latex document and compile it successfully.



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**CO8:** Utilize bibtex feature of including bibliographies and indexes.


### INTRODUCTION TO LATEX:22SBEMM1- MAPPING

#### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	3	3	2	2	2
<b>CO2</b>	3	2	2	3	3	3	2	3
<b>CO3</b>	3	2	2	2	3	2	2	2
<b>CO4</b>	3	3	3	3	2	2	2	3
<b>CO5</b>	3	3	3	3	3	2	2	3
<b>CO6</b>	3	3	3	3	3	2	2	3
<b>CO7</b>	3	3	2	3	2	2	2	3
<b>CO8</b>	3	3	3	3	3	3	2	3
<b>Average</b>	3	3	3	3	3	2	2	3

  
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## SEMESTER VI

### CORE COURSE XII

#### LINEAR ALGEBRA-22SCCMM12

##### UNIT – I:

Vector spaces: Vector spaces – Definition and examples – Subspaces-linear transformation – Span of a set.

##### UNIT – II:

Basis and Dimension: Linear Independence – Basis and Dimension –Rank and Nullity.

##### UNIT – III:

Matrix and Inner product space: Matrix of a linear transformation -Inner product space – Definition and examples – Orthogonality– Gram Schmidt orthogonalisation process – Orthogonal Complement.

##### UNIT – IV:

Theory of Matrices: Algebra of Matrices - Types of Matrices – The Inverse of a Matrix –Elementary Transformations – Rank of a matrix.

##### UNIT – V:

Characteristic equation: Characteristic equation and Cayley -Hamilton theorem – Eigen values and Eigen vectors.

##### UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

The algebra of polynomials

#### Course Outcome

- CO1:** Define basic concepts of vector spaces, linear transformations, inner product spaces.
- CO2:** Prove standard theorems in Linear Algebra.
- CO3:** Distinguish linear independence and dependence; singular and nonsingular
- CO4:** linear transformations; quadratic and diagonal forms.
- CO5:** Determine basis and dimension of vector space, orthogonal basis, eigen values, eigen vector and posets.



Signature of the HOD


## LINEAR ALGEBRA-22SCMM12- MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO5	PO7	PO8
<b>CO1</b>	3	3	3	2	-	1	-	2
<b>CO2</b>	3	3	3	2	-	1	-	2
<b>CO3</b>	3	3	3	3	1	-	1	1
<b>CO4</b>	3	3	3	2	-	-	-	2
<b>CO5</b>	3	3	3	2	1	2	1	2
<b>Average</b>	3	3	3	2	-	1	-	2

  
Signature of the HOD

## **CORE COURSE XIII**

### **COMPLEX ANALYSIS-22SCMM13**

#### **UNIT - I:**

Functions of a Complex variable –Limits-Theorems on Limits –Continuous functions – Differentiability – Cauchy-Riemann equations – Analytic functions – Harmonic functions.

#### **UNIT - II:**

Elementary transformations - Bilinear transformations – Cross ratio – fixed points of Bilinear Transformation – Some special bilinear transformations.

#### **UNIT - III:**

Complex integration - definite integral – Cauchy's Theorem –Cauchy's integral formula –Higher derivatives.

#### **UNIT - IV:**

Series expansions – Taylor's series – Laurant's Series – Zeroes of an analytic functions – Singularities.

#### **UNIT - V:**

Residues – Cauchy's Residue Theorem –Evaluation of definite integrals.

#### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Harmonic Functions

#### **Course Outcome**

- CO1:** Becoming familiar with the concepts Complex numbers and their properties and operations with Complex numbers.
- CO2:** Finding domain and range of complex functions and sketching their graphs.
- CO3:** Evaluating limits and checking the continuity of complex functions.
- CO4:** Checking differentiability and Analyticity of functions.
- CO5:** Evaluate Complex integrals and apply Cauchy integral.



Signature of the HOD

## COMPLEX ANALYSIS-22SCCMM13- MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	2	-	1	1	2
<b>CO2</b>	3	3	2	1	1	2	1	2
<b>CO3</b>	3	3	3	1	-	1	-	2
<b>CO4</b>	3	3	3	1	1	1	-	2
<b>CO5</b>	3	3	3	1	1	1	-	2
<b>Average</b>	3	3	3	1	1	1	-	2



Signature of the HOD

## **CORE COURSE XIV**

### **DYNAMICS-22SCCMM14**

#### **UNIT – I:**

Introduction-Kinematics: Velocity-Relative Velocity-Angular Velocity-Acceleration-Relative Acceleration-Motion in a straight line under uniform acceleration.

#### **UNIT – II:**

Projectile: Projectile-Path of a projectile-Characteristics-Horizontal projection-Projectile up/down in an inclined plane.

#### **UNIT – III:**

Collision of Elastic Bodies: Introduction-Definitions-Fundamental Laws of impact-Impact of a smooth sphere on a fixed smooth plane-Direct impact of two smooth spheres- Oblique impact of two smooth spheres-Dissipation of energy due to impact-Compression and Restitution-Impact of a particle on a rough plane.

#### **UNIT – IV:**

Simple Harmonic Motion: Introduction-S.H.M. in straight line-Compositions of simple harmonic motions of the same period.

#### **UNIT – V:**

Motion Under The action Of Central Forces: Velocity and acceleration in polar coordinates-Equiangular spiral-Differential Equation of central orbits-Pedal Equation of the central orbit-Two-fold problems in central orbits.

#### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Impulsive forces

### **Course Outcome**

**CO1:** knowledge about the basic concepts of kinematics.

**CO2:** Analyze the motion of Projectiles and their results.

**CO3:** Critique the concepts of Central Orbits, differential equation of a central orbit

### **DYNAMICS-22SCCMM14- MAPPING**




Signature of the HOD

## CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO 8
<b>CO1</b>	3	3	2	3	1	2	1	2
<b>CO2</b>	3	3	3	2	2	2	2	2
<b>CO3</b>	3	3	3	2	2	2	2	3
<b>Average</b>	3	3	3	2	2	2	2	3



Signature of the HOD

## MAJOR BASED ELECTIVE II

### GRAPH THEORY - 22SMBEMM2A

#### UNIT - I:

Introduction - The Konigsberg Bridge Problem - Graphs and subgraphs: Definition and Examples - Degrees - Subgraphs - Isomorphism - independent sets and coverings.

#### UNIT - II:

Matrices - Operations on Graphs - Walks, Trails and Paths - Connectedness and Components - Eulerian Graphs.

#### UNIT - III:

Hamiltonian Graphs (Omit Chavatal Theorem) - Characterization of Trees - Centre of a Tree.

#### UNIT - IV:

Planarity: Introduction - Definition and Properties - Characterization of Planar Graphs.

#### UNIT - V:

Directed Graphs: Introduction - Definitions and Basic Properties - Some Applications: Connector Problem - Kruskal's algorithm - Shortest Path Problem - Dijkstra's algorithm.

#### UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):

Independent Sets and Matchings

#### Course Outcome

**CO1:** To understand and apply the fundamental concepts in graph theory.

**CO2:** To apply graph theory based tools in solving practical problems.

**CO3:** To understand the trees.

**CO4:** The students will be able to know the planarity.

**CO5:** To explain Kruskal's algorithm and Dijkstra's algorithm.



Signature of the HOD


## GRAPH THEORY - 22SMBEMM2A - MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	3	2	3	3	3
<b>CO2</b>	3	3	3	3	3	3	3	3
<b>CO3</b>	3	2	3	2	3	2	2	3
<b>CO4</b>	3	2	2	3	3	3	2	3
<b>CO5</b>	2	3	3	3	2	2	3	3
<b>Average</b>	3	3	3	3	3	3	3	3

  
Signature of the HOD



## **MAJOR BASED ELECTIVE III**

### **ASTRONOMY - 22SMBEMM3A**

#### **UNIT - I:**

Relevant properties of sphere and formulae in spherical trigonometry (no proof, no problems) - Celestial sphere and diurnal motion -Celestial coordinates-sidereal time.

#### **UNIT - II:**

Morning and evening stars -circumpolar stars- diagram of the celestial sphere -zones of earth -perpetual day-dip of horizon-twilight.

#### **UNIT - III:**

Refraction - laws of refraction -tangent formula-Cassini's formula - horizontal refraction- geocentric parallax -horizontal parallax.

#### **UNIT - IV:**

Kepler's laws - verification of 1<sup>st</sup> and 2<sup>nd</sup> laws in the case of earth - Anomalies - Kepler's equation - Seasons -causes -kinds of years.

#### **UNIT - V:**

Moon-sidereal and synodic months - elongation - phase of moon - eclipses-umbra and penumbra - lunar and solar eclipses - ecliptic limits - maximum and minimum number of eclipses near a node and in a year - Saros.

#### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Introduction to Astrophysics

### **Course Outcome**

**CO1:** The Learner will acquire basic knowledge about morning, evening stars, circumpolar stars.

**CO2:** Solve the problems with scientific reasoning and critical thinking skills.

**CO3:** Calculation to prepare calendar and conservation of time.



Signature of the HOD


**ASTRONOMY - 22SMBEMM3A - MAPPING**

**CO - PO**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	2	2	3	2	3
<b>CO2</b>	2	3	3	3	2	2	3	2
<b>CO3</b>	3	2	2	2	2	3	2	2
<b>Average</b>	3	3	3	2	2	3	3	2

  
Signature of the HOD

## **SKILL BASED ELECTIVE II**

### **MATHEMATICS FOR COMPETITIVE EXAMINATIONS - 22SBEMM2**

#### **UNIT – I:**

Problems on Numbers- Average-Problems on Ages.

#### **UNIT – II:**

Percentage-Profit & Loss-Simple Interest-Compound Interest.

#### **UNIT – III:**

Ratio & Proportion-Partnership-Calender-Clocks.

#### **UNIT – IV:**

Time and work-Pipes & Cistern.

#### **UNIT – V:**

Time & Distance-Problems on Trains-Boats and Streams.

#### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Simple problems using sets, functions, group theory etc.

### **Course Outcome**

**CO1:** Face competitive examinations with confidence.

**CO2:** Solve a lot of problems on numbers and averages and problems on ages.

**CO3:** Get a lot of training on percentage, profit and loss.

**CO4:** Crack problems on calculating simple interest and compound Interest.

**CO5:** Work on plenty of problems on time and work.



Signature of the HOD

## MATHEMATICS FOR COMPETITIVE EXAMINATIONS - 22SBEMM2 - MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	3	2	3	2	3
<b>CO2</b>	3	3	2	3	2	2	2	3
<b>CO3</b>	3	2	3	2	3	3	3	3
<b>CO4</b>	3	3	3	3	2	2	2	3
<b>CO5</b>	3	3	3	3	3	3	3	2
<b>Average</b>	3	3	3	3	2	3	2	3



Signature of the HOD

## **ALLIED COURSE I**

### **MATHEMATICAL STATISTICS I**

UNIT – I: Statistical data – Primary data and Secondary data( definitions only), Formation of frequency distribution, various measures of central tendency – mean ,median, mode, geometric mean harmonic mean – simple problems – properties of above measures.

UNIT – II: Measures of dispersion – Range quartile deviation mean deviation, standard deviation – their coefficients- merits and demerits (simple problems) – Skewness and kurtosis Karlpearson’s coefficients- Bowley’s coefficients- simple problems.

UNIT – III: Probability- Definition, axiomatic approach to probability - Additive and Multiplicative laws of Probability (two variables only) and Conditional probability – simple problems- Concept of random variables – discrete and continuous random variables - Distribution function, pmf and pdf and their properties simple problems.

UNIT – IV: Mathematical Expectation – addition and multiplication theorems (two variables only) – Moment generating and characteristics functions, their properties – Conditional expectation and conditional variance (simple problems).

UNIT – V: Binomial and Poisson distributions – moments, moment generating function cumulant generating function (Simple problems)- fitting of binomial and poisson distribution.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only): An introduction to SPSS software.

#### **COURSE OUTCOMES:**

**CO1:** Understand random variables and probability distributions.

**CO2:** Know the difference between continuous and random variables.

**CO3:** Acquire the knowledge by using Binomial and Poisson distribution.



Signature of the HOD

## MATHEMATICAL STATISTICS I - 22SCACMS1 - MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	2	1	2	1	2
<b>CO2</b>	3	3	3	2	-	1	1	2
<b>CO3</b>	3	3	2	2	1	1	1	3
<b>Average</b>	3	3	3	2	1	1	1	2



Signature of the HOD

## **ALLIED PRACTICAL**

### **MATHEMATICAL STATISTICS(P)**

UNIT – I: Moments of central tendency- A.M, median, G.M and H.M- Measures of Dispersion- quartile deviation, standard deviation and co-efficient of variation measures of skewness - calculations of first four moments, Central moments, , .

UNIT – II: Bivariate discrete probability distribution- marginal distribution and conditional distribution – Calculation of mean, variance, covariance, correlation coefficient, expectation - conditional expectations and conditional variance.

UNIT – III: Fitting of binomial, poisson and normal distributions (area method only).

UNIT – IV: Calculation of Karl pearson's coefficient of correlation, Spearman's rank correlation and regression equations.

UNIT – V: Large sample tests- Test of single mean- Difference between means – single proposition and Difference between proposition. Exact simple test- t' test for single mean, Difference between means, paired t - test - chi square test for goodness of fit and independence of attributes.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only): An introduction to R package

### **COURSE OUTCOMES:**

**CO1:** Understand and critically discuss the issues surrounding sampling and significance.

**CO2:** Check the given data are correlated or not using Karl Pearson's coefficient of correlation or Spearman's rank correlation.



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## MATHEMATICAL STATISTICS (P) - 22SCACMS1P - MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3	3	3	3
<b>Average</b>	3	3	3	3	3	3	3	3



Signature of the HOD



## ALLIED COURSE III MATHEMATICAL STATISTICS II

UNIT – I: Normal distribution – derivation of normal from binomial – chief characteristics – M.G.F & C.G.F of normal distributions – Moments of normal distributions – area property – fitting of normal distributions.

UNIT – II: Continuous distributions – Rectangular, Gamma, Beta, exponential – distributions - sampling distributions, 't', 'F' and Chi-square distributions.

UNIT – III: Correlation – Rank correlation, Karl Pearson's correlation co-efficient and its properties. Linear regression and its properties, concept of multiple and partial correlation for three variables only.

UNIT – IV: Test of significance – Definition of null hypothesis, alternative hypothesis, sampling distribution, standard error and critical region. Type I and Type II errors, one tailed and two tailed tests. Large sample test for single mean, Difference between means, single proportion and difference between proportions.

UNIT – V: Small sample tests – 't' test for single mean. Difference between means. Paired 't' test, Chi-square test for goodness of fit and independence of attributes.

UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only): An introduction to Data science.

### COURSE OUTCOME:

**CO1:** Understand the meaning of correlation, regression and its properties.

**CO2:** Apply the concepts of t, F, z distributions and its applications.

**CO3:** Apply the concepts of sampling techniques and procedure of testing of hypothesis for large samples.



Signature of the HOD


## MATHEMATICAL STATISTICS II - 22SCACMS2 - MAPPING

### CO - PO

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
<b>CO1</b>	3	3	3	3	3	3	3	3
<b>CO2</b>	3	3	3	3	2	2	2	2
<b>CO3</b>	3	3	3	3	2	2	2	2
<b>Average</b>	3	3	3	3	2	2	2	2



Signature of the HOD

**PG DEPARTMENT OF HOSPITAL ADMINISTRATION**

**SHRIMATI INDIRA GANDHI COLLEGE**

(Nationally Accredited at A Grade (3<sup>rd</sup> cycle) by NAAC)

(Affiliated to the Bharathidasan University)

An ISO 9001:2015 Certified Institution

Tiruchirappalli – 2

**Programme Outcomes in Science (PG) (PO)**

PO1: Attained profound Expertise in Discipline

PO2: Acquire the basic tools needed to carry out independent research.

PO3: Proficient in their specialized area and successfully complete an advanced research project.

PO4: Develop skills in problem solving, critical thinking and analytical reasoning as applied to scientific problems.

PO5: Acquired ability to Function in Multidisciplinary Domains

**Syllabus: P22HACC11 - Core Course I -**

**PRINCIPLES OF HOSPITAL ADMINISTRATION &  
HEALTH ECONOMICS**

**SEMESTER -I**

**UNIT – I:**

Management-Definition - -management as a process-managerial skills-levels of management. Concepts of management-models of management- functions of management. Evolution of Management theory-Peter Drucker-Henry Fayol's 14 principles of management - Management by objectives.

**UNIT – II:**

Introduction to Hospital -Parts of Hospital – Role of Hospital in Health care delivery – Hospital, relation to other health care services – Role of hospital administrator.

**UNIT – III:**

Health Economics - Nature & Scope of Economics – Demand analysis – Law of demand – Demand Curve – Supply analysis – Consumer behaviour.

**UNIT – IV:**

Health market – categorization of consumption – Engel's Law of Utility Analysis – Indifference analysis

## **UNIT – V:**

Value for money in Health Care – Health Policies – Government’s Role in Different Socio-economic Systems. Pricing Policy.

## **UNIT – VI**

**CURRENT CONTOURS** (For continuous internal Assessment only): Group discussion (Role of different socio -economic system – Role of hospital administrator)

## **REFERENCES:**

1. Harold Koontz, Heniz, Weimirich: Management
2. James A.F., Stones., R Edward: Management
3. Rustom S. Daver: Principles of Management
4. James A William: Hospital Management, Mac Milliam Education Ltd., New Delhi.
5. Mr. Edwin Marshfield : Managerial Economics, Mc GrawHill
6. R.L. Varshni & K. Maheshwary: Managerial Economics, S.Chand
7. S.Mookerjee: Economics–Fundamentals & Foundations.

### **CORE COURSE I - PRINCIPLES OF HOSPITAL ADMINISTRATION & HEALTH ECONOMICS (CO)**

- Identify and demonstrate the dynamic nature of the environment.
- Apply conceptual frameworks,
- Theory and techniques to lead the organization in achieving its goals
- Understand the roles of managers and administrators
- Describe key concepts, theories and techniques for analyzing different organizational situations.

P22HACC11- Principles of Hospital Administration and Health Economics

MAPPING

CO – PO matrices of course

1:Slight (Low) 2:Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

M.Sc Hospital Administration

PO-CO	PO1	PO2	PO3	PO4	PO5
CO 1	3	3	3	3	3
CO 2	3	3	3	3	3
CO 3	3	2	3	3	3
CO 4	3	2	3	3	3
CO 5	3	2	3	3	3
Average	3	2.4	3	3	3



## **Syllabus: P22HACC12 - Core Course III -**

### **BASIC BIOLOGICAL SCIENCE**

#### **COURSE OBJECTIVE:**

The course enables the students to perceive the biological structure and basis of human biology and pathogens and to understand the spectrum of health and disease to evolve health promotion strategic in system management.

#### **UNIT – I**

An introduction to basic Human anatomy and study of basic vital organs. Anatomy of Heart, Ear, Eye, Brain, Kidney. – Medical Terminology

#### **UNIT – II**

Physiology: Introduction to Human physiology & study of various systems – Circulatory system – Central Nervous System – Autonomous Nervous System, Reproductive System, Digestive System, Respiratory System – Sensory organs and their functions –Glands.

#### **UNIT – III**

Biochemistry of proteins – Fat – Amino acids – Carbohydrates metabolism – Enzymes– Vitamins–Hormones–Blood chemistry

#### **UNIT - IV**

Microbiology: Introduction to Classification & General Characteristics of various micro-organisms - microbiology of food born diseases and food preservation relating.

#### **UNIT - V**

Introduction to Parasitology – commonly prevailing parasites – diseases – identification and treatment.

#### **UNIT – VI**

CURRENT CONTOURS (For continuous internal Assessment only) Human body organs draw the structure and functions, seminar, assignment

#### **REFERENCES**

1. Anatomy and Physiology for Nurses. Physiology: K. Madhavan Kutty Microbiology: Ananthanarayanan Phraseology: Chatterjee Entomology Roy and Brown.

## Core Course II – BASIC BIOLOGICAL SCIENCE PART - I (CO)

- Provide basic knowledge about human anatomy and physiology
- Study the various systems in human body and its functions
- Integrate various aspects of metabolism and their regulatory pathways
- Provide basic concepts of balanced diet
- should demonstrate an ability to use and apply appropriate methods in biological system

### P22HACC12-BASIC BIOLOGICAL SCIENCE

#### MAPPING

#### CO – PO matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

M.Sc Hospital Administration

PO-CO	PO1	PO2	PO3	PO4	PO5
CO 1	3	2	3	3	3
CO 2	3	3	3	3	3
CO 3	3	3	2	2	3
CO 4	3	3	2	2	3
CO 5	3	3	2	3	2
Average	3	2.8	2.4	2.6	2.8



## **CORE CHOICE COURSE I**

### **MANAGERIAL COMMUNICATION AND PUBLIC RELATION**

#### **COURSE OBJECTIVES:**

The topic is intended to provide knowledge and skills about various communication proceedings involved in the management process and also to acquaint them the need of effective public relations & counselling.

#### **UNIT – I**

Communication in Management Process – meaning & importance – Formal & Informal Communication – methods – Barriers of communication

#### **UNIT – II**

Business communication - meaning & significance - types. Business correspondence - drafting of business letters - reports – circulars - press releases – press conferences.

#### **UNIT – III**

Meeting documentation - notice of the meeting - agenda - writing minutes – minute book-writing meeting reports–Writing annual reports. UNIT – IV: Public relations - scope - tools - public relation as a catalyst for change. public relations - with individual - group organisation - press - government departments. Press language - news - new writing - publicity - media planning.

#### **UNIT – V**

Counselling – Definition – scope – importance – types – techniques of effective counselling – Self environment in an organization – Relationships – interpersonal effectiveness–dimension so effectiveness.

#### **UNIT – VI**

**CURRENT CONTOURS** (For continuous internal Assessment only)  
Business letters- report- press language-(presentation- seminar)

#### **REFERENCES:**

1. Dalmer Fisher: Communication in Organisation's., Jaico Publishing Co., Bombay.
2. Balan K.R. Prof: Corporate Public Relations, Sterling Publishers Pvt. Ltd, New Delhi.
3. Krishna Mohan & Meera Banerji: develeping Business 6 Communication., McMillian EducationLtd.,
4. Raymond V Lesikar John., D Pettil Jr. & Lakshman C Arya: Business communication, All India Traveler Book Seller, New Delhi.
5. Margues & Raja: Organizational Development, Prentice Hall.
6. Edger Schein & Warren Benis: Personal & Organization a change through Group methods, Tata Mc Graw Hill.



## COURSE OUTCOME:

- Complete understanding and knowledge of and Public Relations (PR) and Communication skills through this program
- Increased knowledge, skill and confidence to undertake higher roles and responsibilities related to public relations and media relations, fostering career growth and progression
- Increased awareness and experience to build and maintain a good working relationship with media professionals
- Understand the scope of communication and learn its importance and implication strategies
- Recognize and learn the sub-skills of listening and speaking and be able to deliver effectively in the real time contexts.

P22HACC1A- Managerial Communication and Public Relations

### MAPPING

#### CO – PO - matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

M.Sc Hospital Administration

PO-CO	PO1	PO2	PO3	PO4	PO5
CO 1	3	3	3	3	3
CO 2	3	3	3	3	3
CO 3	3	3	3	2	3
CO 4	3	3	3	3	3
CO 5	3	3	3	3	3
Average	3	3	3	3	3



## **P22HAE1A - HUMAN RESOURCE MANAGEMENT**

### **COURSE OBJECTIVE:**

The course enables the student to get perspective on human resources. Further it familiarizes the students with various concepts, issues and practices in dealing with people in health sector organizations.

### **UNIT – I**

Definition – Concepts – scope –relation to other departments – organization of the department – functions.

### **UNIT – II**

Man power planning – job analysis – job description – recruitment – selection – methods of selection – Types of interviews – types of tests – induction.

### **UNIT – III**

Training & development – need for training – types & methods – performance appraisal – motivation –counseling.

### **UNIT –IV**

Wage & Salary administration – principles and techniques of wage fixation- Job evaluation - Merit rating methods of wage payment – incentive schemes – employee welfare – occupational safety – collective bargaining – employee participation in management.

### **UNIT – V**

Labour relations – ESI Act – Factories Act – Payment of wages act – provident fund & provisions - trade union act – promotion - transfer – discipline – disciplinary procedures –Planning for retirement.

### **UNIT – VI**

**CURRENT CONTOURS** (For continuous internal Assessment only) HR Role, Importance (group discussion)

### **REFERENCES:**

1. Chatterjee NN: Management of Personals in Indian Enterprises, Allied Book Agency, Calcutta.
2. Dale S. Beach: Personal, Mac Millian Publishing Co.,
3. Finley RT: Personal Manager and his job, American Management Association, New York.
4. Mammoria C.B.: Personnel Management, Himalaya Publishers
5. Tripathi P.C.: Personnel Management and Industrial Relations., Sulthan Chand & Co.,
6. J.B. Miner & M.G. Miner: Personal and industrial Relations A Managerial Approach
7. Southwick Arthur F: law of Hospital and Health Care Administration.

P22HAE1A -Elective II - HUMAN RESOURCE MANAGEMENT(CO)

- Understand the importance of human resource management
- Use the different methods of recruitment in procuring human resource
- Design relevant appraisal methods for employee compensation, rewards and benefits.
- Organize training and development activities to enhance the knowledge, skill and abilities
- Apply modern trends in human resource management

P22HAE1A- HUMAN RESOURCE MANAGEMENT  
MAPPING

CO – PO - matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

M.Sc Hospital Administration

PO-CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3



## **P22HACC21- HOSPITAL FACILITIES PLANNING AND ADMINISTRATION**

### **COURSE OBJECTIVES**

The course enables the students to plan in advance to face the various problems related to hospital administration and to take preventive actions accordingly. This also enables the students to acquire knowledge about the concepts for provision of good facilities for patient care to ensure best possible return on investment in health facility through good planning

#### **.UNIT – I**

Hospital Planning – objectives- guiding principles in planning Hospitals – facilities & services- Preliminary survey & feasibility study.

#### **UNIT – II**

Selection of Location – functional plans of Hospital construction - the design team(Architect, Engineer & Hospital Administrator) – financial planning – equipment planning- Human resource planning - functional and operational planning.

#### **UNIT – III**

Furnishing and equipping the Hospital – commissioning the Hospital – organization of the Hospital – organizational structure – planning & designing of Administrative departments.

#### **UNIT – IV**

Planning & designing of Medical services – Out patient & emergency services – clinical laboratories - radiology dept. – Medical records dept. Central Sterilization and Supply Dept. (CSSD) – pharmacy – food service – house keeping – nursing dept. –surgical dept. – Labour & development suites.

#### **UNIT – V**

External interference in planning (Govt. agencies & Local bodies). Waste Management in Hospitals – Methods – Types of wastes. Maintenance planning – Electrical – Civil – Safety & security –water supply. Application of method study – work measurement study – Time management.

#### **UNIT – VI**

**CURRENT CONTOURS** (For continuous internal Assessment only):  
Group discussion – assignment -seminar (waste disposal management in hospital - Time management) 13

### **REFERENCES**

1. G.D.Kunders: Hospitals-Planning, Design & Management, Tata Mc. Graw Hill
2. Convert Richard P & Mc Nulty Elizabeth: Management Engineering for Hospitals, Chicago.
3. Dee gum 11 & Arthur: Management by Objectives, Maryland, Aspen 1977.
4. Desai V A : Hospital Administration Vol 1 Madurai, 1989. Goel S L & Kumar R: Hospital Administration and Management Vol 2, New Delhi, Deep.

## COURSE OUTCOMES

- Have sufficient competency to understand the basic principles, science, processes and practices of Health Facility Planning.
- Develop the basic capability in the application and practice of the subject.
- Overview of Health Facility Planning as a branch of Health Planning discipline
- Learning about the foundation of Standards and Guidelines for Health Facility Planning
- Apply various principles of planning and management in implementing health projects and programmes.

**P22HACC21- HOSPITAL FACILITIES PLANNING AND  
ADMINISTRATION - MAPPING  
CO – PO - matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

**M.Sc Hospital Administration**

PO-CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3



## **P22HACC22 - ACCOUNTING AND FINANCIAL MANAGEMENT**

### **COURSE OBJECTIVES:**

The topic helps the students to acquaint themselves with the basic concepts of cost and management accounting and with the basic concepts of financial planning and control and its applications in the financial decision making.

### **UNIT – I**

Accounting Concepts- conventions and definitions- branches of accounting & classification of accounting – distinguished assets – liabilities – income & expenses. Understand nature of debit & credit.

### **UNIT – II**

Documentation – form of record maintenance – journalizing the transaction – cashbook – purchase book – sales book – sales return book – purchase return book – opening balance incorporation – preparation & posting – balancing of ledger accounts – trial balance – bank reconciliation statement.

### **UNIT – III**

Basics of preparation of financial accounts – profit & loss account- balance sheet –

### **UNIT – IV**

Ratio analysis - introduction – benefits – problems (only simple problems), financial management - introduction – meaning – objectives – advantages – limitations– difference between management accounting and cost accounting.

### **UNIT – V**

Cost accounting – meaning – cost classification – elements of costing – cost sheet – Budgeting – meaning – scope – problems in fixed budget – cash budget – flexible budget – production budget – sales budget – special issues in Hospital finance management.

### **UNIT – VI**

CURRENT CONTOURS (For continuous internal Assessment only) Resend trends financial data seminar, assignment.

### **REFERENCES:**

1. Khan M.Y. Jain P.K.: Financial Management, Tata Mc Graw Hills
2. Prasanna Chandra: Financial Management, Tata Mc Graw Hills 15  
Bhattacharya S.K.&
3. Dearden J: Accounting for Management – Text & Cases, Vikas  
Publishing. 4. S.N. Maheswari: Financial Management, Sultan Chand  
Publications. M.C.S hukla
5. T.S. Grewal: Advanced Accounts, Sultan Chand & Co. S.P. Jain &
6. K.L. Narang: Cost accounting – Principles & Practices, kalyani Publishers.

## COURSE OUTCOMES

- To find out the finance and investment opportunities and their suitability in particular circumstances
  - To apply capital budget project using traditional methods.
  - Analyze the main ways of raising capital and their respective advantages and disadvantages
- Illustrate how to record and report cash, receivables, long-lived assets, liabilities, and stockholders' equity items and identify related potential unethical accounting practices.
- To apply their financial concepts to calculate ratio and the capital budget.

### P22HACC22 - ACCOUNTING AND FINANCIAL MANAGEMENT - MAPPING

#### CO – PO - matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

#### M.Sc Hospital Administration

PO-CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3
CO2	2	3	3	2	3
CO3	3	3	3	2	3
CO4	3	3	3	2	3
CO5	3	3	3	2	3
Average	2.8	3	3	2	3

## **P22HACC2A - MARKETING FOR HEALTH CARE SERVICES**

### **COURSE OBJECTIVE**

The course introduce the student to the concepts of marketing and its dimensions involving service, production, promotion and its application to health care delivery systems.

### **UNIT - I**

Marketing Concept - definition - scope. Hospital Administrators and marketing - Environment - Opportunities and challenges. Market analysis: Health care needs - factors influencing patient behavior - market segmentation - chief determining variable strategy in product positioning for health care services.

### **UNIT –II**

Market research and information: Steps -market information - market decision support systems – demand forecasting. Product service: Product line - product mix - product life cycle - branding - packaging - product positioning - new product opportunities - product development process - new product - failure and success.

### **UNIT – III**

Promotion: Objectives - promotion cost - promotional budgets - determining promotional mix planning - promotional campaigns. Advertising and Publicity: types - levels of advertising - advertising expenditure - advertising decisions -publicity.

### **UNIT – IV**

Pricing - Meaning - importance - factors determining prices - objectives - pricing policy and structure - pricing procedure - new product pricing. Market information system: Marketing channel - physical distribution – channel design

### **UNIT – V**

Marketing programme: market mix - product decisions - price decisions - location of hospital services - planning extension services. Camp organizing and planning: community health care programmes - medical camps - awareness of camps - planning and organizing medical camps - follow - up.

### **UNIT – VI**

**CURRENT CONTOURS** (For continuous internal Assessment only) Group discussion – seminar- assignment ( new product price- market channel – physical distribution)

### **REFERENCES:**

1. Kotler Philps: Marketing Management - Analysis, planning, Implementation and control.
2. Kotler Philps: Principles of Marketing; Prentice Hall, Eaglewood Cliffs., NJ., 1980.



3. Kotler Philps: Reading in Marketing Management., Tata Mac Graw Hill, New Delhi,1980
4. Kotler Philps: Marketing for Health Care Organisations.
5. Lovelock: Services Marketing - Text, cases and readi.

**COURSE OUTCOME:**

- Perform a thorough competition analysis
- Research and properly decide on segmentation, targeting and position
- Gain the knowledge of building effective customer relationships
- Innovate and develop new products
- Understand how to better manage a brand

**P22HACC2A-MARKETING FOR HEALTH CARE SERVICES (CO)**

- Understand and explain nature and scope of marketing
- Provide theoretical basis for assessing performance
- Identify characteristics and challenges of firms in modern world.
- Discuss key linkages between marketing and other business functions.
- Work effectively and efficiently in a team addressing marketing topics.

**P22HACC2A -MARKETING FOR HEALTH**

**CARE SERVICES - MAPPING**

CO – PO matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

**M.Sc Hospital Administration**

PO-CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3



## **P22HAE2A - REWARDS MANAGEMENT**

### **COURSE OBJECTIVES:**

Basically, these levels are based on the parameters of skill, knowledge, capabilities and qualifications of human resources. Within present HR scenario, different organisations are much devoting their personnel efforts to manage and maintain their compensation and reward system.

### **UNIT – I**

Introduction to Compensation: Definition of Compensation, Basic concepts of Compensation. (wages, salary, benefits, DA, consolidated pay, Equity based programs, commission, reward, remuneration, bonus etc.), Types of Compensation Management - The Pay Model, Strategic Pay Policies, Strategic Perspectives of Pay, Strategic Pay Decisions, Best Practices vs. Best Fit Options.

### **UNIT – II**

Internal Alignment: Definition of Internal Alignment, Internal Pay Structures, Strategic Choices in Internal Alignment Design, Internal Structure. Employee Contributions: Pay For Performance (PFP): Rewarding Desired Behaviours, Designing PFP Plans, Merit Pay/Variable Pay, Compensation of Special Groups, Compensation Strategies for Special Groups

### **UNIT – III**

Job Evaluation: Definition of Job Evaluation, Job Evaluation Methods, Final Result - Pay Structure - various methods of calculation of compensation: Straight Halsey Premium Bonus Plan, Halsey Weir Premium Plan, Rowan Premium Bonus Plan, Emerson Efficiency Plan, Bedeaux Point Method. Based on productivity: Taylor Differential Piece Rate Method, Merrick's Multiple Piece Rate Plan, Gantt's Task & Bonus Wage Plans.

### **UNIT – IV**

Competitiveness: Definition of Competitiveness, Pay Policy Alternatives, Wage Surveys, Interpreting Survey Results, Pay Policy Line, Pay Grades Benefits: Benefits Determination Process, Value of Benefits, Legally Required Benefits, Retirement, Medical, & Other Benefits.

### **UNIT – V**

Incentives: Positive & negative incentives, Types of individual incentives: incentive plans for blue collar workers: individual incentive plans: based on time & based on productivity. Group incentive plans: Pristman's plan, scanlan plan, profit sharing, co-partnership, cafeteria compensation plan, ESOP. incentive plans for white collar worker: straight salary, straight commission, combination plans. 22

### **UNIT – VI**

CURRENT CONTOURS (For continuous internal Assessment only) Designing PFP Plans, Merit Pay/Variable Pay, Compensation of Special Groups, Compensation Strategies for Special Groups - presentation- seminar

## **REFERENCES**

1. Compensation & Reward Management, BD Singh, 2nd edition, Excel books, 2012.
2. Compensation, Milkovich & Newman, 9th edition, 2017, Irwin/McGraw-Hill.
3. Compensation and Benefit Design, Bashker D. Biswas, FT Press, 2012.
4. An Introduction to Executive Compensation, Steven Balsam, Academic Press, 2002.
5. Strategic Compensation, Joseph J. Martocchio, 3rd Edition, Prentice Hall, 2004.
6. Compensation Management in Knowledge based world, Richard I. Anderson, 10th edition, Pearson Education.
7. Compensation Management, Er Soni Shyam Singh, Excel Books.

## **COURSE OUTCOME**

- Develop a knowledge of the range of benefits and remuneration that can be employed to attract, motivate and retain key groups of employees
- Carry out basic role analysis and draw on benchmarking and other factors affecting pay to advise on appropriate reward systems and remuneration packages
- Develop a knowledge of the basic terminology and elements involved in pension schemes
- Undertake a piece of independent, guided research investigating a topic within the field of Reward Management and HRM.
- Understanding the implications for Performance and Reward Management in the present organizational dynamics with case studies

P22HAE2A-REWARDS MANAGEMENT

MAPPING

CO – PO -matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

M.Sc Hospital Administration

PO-CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3



## **P22HACC31 - ETHICS, LEGAL ASPECTS OF HOSPITAL ADMINISTRATION**

### **COURSE OBJECTIVES:**

The course is intended to guide students to understand the various levels of Health administration and their functioning and also to have a general idea about the legal aspects related to Hospitals. Health Care Administration:

#### **UNIT – I**

Health Care Administration at the Union Level - Organization and working of the ministry of Health & Family Welfare–Indian Systems of Medicines.

#### **UNIT – II**

Health Administration at the State level – Organization of State Health Dept. – Structure & functions. District Health Care Administration – Structure & Functions.

#### **UNIT – III**

National Health Planning – analysis of the Govt. Committee reports – Decision on the Five year health plan of the Govt .Legal Frame Work:

#### **UNIT – IV**

Medico-legal Problems – types – case handling procedures – police investigation – court deliberation – death certificates - Consumer Protection Act-1986 and Hospitals – Medical Negligence – Medical Malpractice.

#### **UNIT – V**

Clinical Investigation Laws – Blood Transfusion Act – Medial Termination of Pregnancy Act – Drugs & Cosmetics Act – Birth & Death Registration Act – Pre-natal Diagnostic Techniques (Regulation & Prevention of Misuse ) Act.

#### **UNIT – VI**

**CURRENT CONTOURS** (For continuous internal Assessment only) Medico Legal Cases - case handling procedure - Presentation-seminar

### **COURSE OUTCOMES**

- To apply the knowledge of ethics in the functioning of the hospital.
- To be able to handle various issues related to healthcare setup and also manage the hospital with the various issues that can arise from the legal perspective. 27
- To recognize and train the workforce to meet the challenges of changing dynamics in healthcare scenario in terms of the regulations that govern the operational aspects of the hospital.
- To be able to demonstrate the necessary knowledge, skill and competencies required for good administrator as significant contributor in healthcare

- Anticipate, identify and reflect on problems regarding integrity, ethics and law in their own lives

**REFERENCES:**

1. S.L. Goel, Health Care System & Management, Deep & Deep Publications
2. Syed Amin Tabish, Hospital & Health Service Administration, Oxford University Press
3. Misra S.N.: Labour & Industrial Laws, Central Law Publications, Allahabad.
4. Agarwal V.K.: Consumer Protection-Law & Practice, BLH Publishers & distributors
5. Dr. Mahendra K. Joshi: Doctor & Medical Law, Ahammedabad Bag R.K.: Law of Medical Negligence & Compensation, Eastern Law House, New Delhi.

**P22HACC31-ETHICS, LEGAL ASPECTS OF HOSPITAL ADMINISTRATION**

**MAPPING**

CO – PO - matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

**M.Sc Hospital Administration**

PO-CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3



## **P22HACC32 - RESEARCH METHODOLOGY**

### **COURSE OBJECTIVES:**

The topic is intended to provide an adequate knowledge about research methods to help them in research work settings whenever survey design and secondary data analysis is involved in the health system.

### **UNIT – I:**

Research methods - meaning - types - objectives - nature - scope. Scientific research - role of theory in research - research problem - concepts - formulation - identification - selection of research problems in management.

### **UNIT – II**

Hypothesis - testing of hypothesis bias. Research design in medical research - types - descriptive - experimental - exploratory. ecological - cohort - action research - case control.

### **UNIT – III**

Methods of data collection - source - methods - tools - observation - personal interviews – interview schedule. Sampling – concepts – advantages - limitations – types.

### **UNIT – IV**

Data processing and analysis - problems - types of analysis - inference - planning - evolution.

### **UNIT – V**

Research report – introduction – types – contents of report – steps in drafting reports

### **UNIT – VI**

**CURRENT CONTOURS** (For continuous internal Assessment only): Methods of data collection - Types of research (seminar-Presentation)

### **REFERENCES:**

1. Sarantakos: Social Research, Macmillan Press, Australia.
2. Festinger and Katz: Social Research., Long man., London
3. Jathoda Marieetal: Research methods in Social Relations, Free Press, New York.
4. Kothari C.R.: Research methodology - Methods and techniques. Wiley Eastern Limited, Delhi.
5. Goode and Hatt: Research Methods in Social Sciences.

### **COURSE OUTCOME:**

- Understanding the nature of problem to be studied and identifying the related area of knowledge.
- Reviewing literature to understand how others have approached or dealt with the problem.
- Collecting data in an organized and controlled manner so as to arrive at valid decisions.
- Analyzing data appropriate to the problem.
- Drawing conclusions and making generalization.

## P22HACC32- RESEARCH METHODOLOGY

### MAPPING

#### CO – PO -PSO matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

#### M.Sc Hospital Administration

PO-CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3





## **P22HACC3A - MANAGEMENT CONCEPTS**

### **COURSE OBJECTIVES:**

To provide improve of an organization

#### **UNIT – I:**

Introduction: Management – Definition, Principles, Functions and Role, Management as science, art and profession, contribution of Taylor, Henry Fayol and Elton Mayo in the area of management

#### **UNIT – II:**

Planning and Decision Making: Planning: Definition importance of planning, steps in planning, types of planning, Limitation of planning, Types of plans – Objectives, Hierarchy of objectives, MBO – Process, Benefits. Problems & Limitations, Policies & Procedures – Characteristics of sound policy & procedures Decision Making process, Making effective decision.

#### **UNIT – III:**

Organizing: Organization structure – Role, Features of good organization structure, Departmentation, bases of departmentation, Span of management, centralization & Decentralization – Factors determining degree of decentralization

#### **UNIT – IV:**

Directing: Motivation – definition, Importance, Motivation Theories – Maslow, Herzberg, McGregor's motivation theories. Job enrichment, Job enlargement, Job rotation, Job satisfaction. Leadership – Definition, Qualities of a leader, Leadership styles-power orientation, Managerial Grid, Tridimensional Grid Communication – Communication process, oral, written & Nonverbal communication, Formal & Informal communication, barriers in communication, making communication effective.

#### **UNIT – V:**

Controlling: Definition, Importance of control, steps in controlling, essentials of effective control system, Management by exception, Benefits of management by exception.

#### **UNIT – VI:**

**CURRENT CONTOURS** (For continuous internal Assessment only): Quality of a leader-styles- communication process( presentation – seminar)

### **REFERENCES:**

1. L.M.Prasad, Principles & Techniques of Management, Sultan Chand & Sons.
2. Dinkar & Tagore, Business Management
3. Koontz Z & 'O' Donnel, Essentials of Management
4. Tripathi & Reddy, Principles of Management.



## COURSE OUTCOMES:

- Recognize the principles of authority, leadership, behaviour of individual and team
- Translate management and organizational behaviour theories into practice that will result in organizational effectiveness, efficiency, and human resource development.
- Understand themselves and other people at work and will be able to learn how to create effective work groups at workplaces and become effective employees in all domains of managerial work they do in the future.
- Have a conceptual knowledge about the planning and decision making
- Evaluate leadership style to anticipate the consequences of each leadership style

## P22HACC3A- MANAGEMENT CONCEPTS

### MAPPING

#### CO – PO - matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

#### M.Sc Hospital Administration

PO-CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3



## **P22HAE3A - TRAINING AND DEVELOPMENT**

### **COURSE OBJECTIVES:**

- Training and development are not limited to just increasing productivity and efficiency, but the busy market and ceaselessly active competition of today, demands much more than that from organizations. It's all thanks to the conditions that a company faces and the race of "growth" that has made the addition of new skills and improvement of the existing skill-set, which is an extremely important aspect of a business.

### **UNIT – I:**

Systematic Approach to Training: Introduction to training, need for Training and Development, Importance of Training and Development in an organization. Assessment phase, Training and Development phase, Evaluation phase, Training administrations

### **UNIT – II:**

Needs Assessment and Analysis: Organizational Support for need assessment, Who should participate in Need Assessment, Organizational analysis, Person analysis, Task Analysis, Competency Model

### **UNIT – III:**

The Learning Environment: Learning theories, learning styles, learning principles, The Learning Organization and challenges to become a learning organization, trainee motivation to learn, Instructional Emphasis for Learning Outcomes

### **UNIT – IV:**

Transfer of Training: Considerations in designing Effective Training Programs, Training Design, Work Environment Characteristics, Organizational Environment Characteristics encourage Transfer, Various Training Methods Trainer's Role: Role of Trainers, Qualities of a good Trainers, Internal Trainer Vs External Trainer

### **UNIT – V:**

Training Evaluation and Measurement: Process of evaluation, Outcomes used in the evaluation of a training program, Determining ROI of Training Special Issues in Training & Development: Training in various sectors including Banking, BPO, IT, Training Issues resulting from External & Internal Environment, succession planning 33

### **UNIT – VI:**

**CURRENT CONTOURS** (For continuous internal Assessment only): Training Evaluation and Measurement- Process of evaluation (presentation seminar)

### **REFERENCES:**

1. Employee Training & Development by Raymond No.
2. Bridging the Soft Skills Gap: How to Teach the Missing Basics to Today's Young Talent by Bruce Tulgan.
3. Design for how People Learn by Julie Dirksen
4. Workplace Learning: How to Build a Culture of Continuous Employee Development by Nigel Paine
5. The Six Disciplines of Breakthrough Learning: How to Turn Training and Development Into Business Results by Andy Jefferson, Calhoun W. Wick, and Roy V. H. Pollock

**COURSE OUTCOMES:**

- Understand the need and process of training need analysis in organizations.
- Understand the process of designing a training programme and its evaluation
- Understand various training methods and their applicability in different organizational situations.
- Comprehend the tools and techniques of management development.
- To provide an insight into what motivates adults to learn and the most appropriate methodologies to impart training

**P22HAE3A -TRAINING AND DEVELOPMENT**

**MAPPING**

CO – PO -matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

**M.Sc Hospital Administration**

PO-PSO- CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3



## **P22HACC41 - ADMINISTRATION OF HOSPITAL AND MEDICAL RECORDS MANAGEMENT**

### **COURSE OBJECTIVES:**

- To provide the develop and manage the medical and health information services.

### **UNIT – I**

Ward Management: Ward, ward nursing, ward level, inventory, receipt of patients, types of beds, bed space requirements, discharge procedures, specific requirements for specialties, preventing of hospital infections.

### **UNIT – II**

Risk Management & Disaster Management: Meaning of risk management, general principles of risk identification, risk management philosophy implementing risk management, legal implications, common disasters –national level, hospital level – guiding principles in managing the situations, formation of disaster management groups.

### **UNIT – III**

Recent developments: Challenges for the hospital administrator, vital role of hospital administrator, telemedicine, health tourism, medical transcription, joint venture hospitals, emergence of corporate hospitals, ISO, health insurance, medical transcription, TQM.

### **UNIT – IV**

Hospital Statistics: Outpatient statistics -daily average outpatient attendance, average outpatient attendance etc .In patient statistics – Bed occupancy rate, bed turn overrate. Hospital morbidity mortality - gross & net death rate, Institutional death rate, anesthesia death rate, post-operative death rate, MMR,IMR

### **UNIT – V**

Medical Records: Definition – Importance with reference to patient doctor, hospital & research .Brief mention about ownership rights & privileges, policies governed procedures with reference to numbering system, unit system, International Classification of disease &its usage. Medical audit committee – constitution, functions and limitation. Service by service discussion in Medical Audit.

### **UNIT – VI**

**CURRENT CONTOURS** (For continuous internal Assessment only): Risk factor- common Disaster – Hospital Statistics (seminar -Presentation) 39

### **REFERENCES:**

1. Charlesshaw.MedicalAudit–AHospitalhandbookstandardsofCare&Practice
2. Syed Amin Tabish, Hospital & Health service Administration, Oxford Univeristy press

3. Francis CM. & Mario C de Souza, Hospital Administration, Jay pee Brothers, New Delhi  
 4. Goel SL.& Kumar R., Hospital Administration & Management, Deep & Deep Publications  
 Sankar Rao, Hospital Organization & Administration

P22HACC41 - COURSE OUTCOMES:

- Management procedures for MRD in depth
- Organization of Medical Records for different speciality hospitals
- Computerising medical records management system
- Development of hospital information system (HIS) including medical, nursing and paramedical
- Comprehensive implementation with problems and solutions of electronic health records.

P22HACC41- ADMINISTRATION OF HOSPITAL STAFF AND MEDICAL RECORDS  
 MANAGEMENT

MAPPING

CO – PO -matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

M.Sc Hospital Administration

PO-PSO- CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3



## **P22HACC42 - STRATEGIC MANAGEMENT**

### **COURSE OBJECTIVES:**

- The course enables the student to understand the different ways to utilize firm's resources within its environment to reach its objective and to impart the knowledge and skills to identify the need for facilities, selection and effective utilization and maintenance of facilities.

### **UNIT – I**

Strategic Management – meaning – benefits – process of strategic planning & management. Levels of strategy - dimensions of strategic decisions – strategic planning in non-profit organizations - N.C. Kinsey's 7-Sframe work.

### **UNIT – II**

Organization purpose or mission – corporate objectives – SWOT analysis – objectives & goals – importance – need. Identifying critical success factor -BCG Matrix – GE Business Portfolio Matrix.

### **UNIT – III**

Social aspects of strategic management – concepts –dimensions – Environmental analysis – meaning – need for environmental scanning– characteristics of environmental analysis – environmental forces– internal & external.

### **UNIT – IV**

Strategic choice – corporate portfolio analysis, industry – competitor analysis – strategic implementation – issues in implementation – resource allocation – structural implementation – organizational design &change.

### **UNIT – V**

Forecasting techniques – Delphi method – visionary forecasts – Time series analysis – moving average – exponential smoothing – strategic and operational control.

### **UNIT – VI**

**CURRENT CONTOURS** (For continuous internal Assessment only): SWOT Analysis - BCG Matrix Assignment – Seminar

### **REFERENCES:**

1. P.K. Ghosh: Strategic Management & Planning, Sultan & Chand
2. Chari S.N: Modern Production and Operations Management, Wilsey 41 Eastern Ltd. New Delhi.
3. Azhar Kasmi: Business Policy. Kotler Philip : Marketing's role in non-profit organizations, PHI

4. Joseph P Peters & Simone T. Sehg : Managing strategy change in Hospital – 10 success stories, PHI

5. John A. Pearce & Richard B. Robinson: Strategic Management, AITBS Publisher

**COURSE OUTCOMES:**

- To Understand the basic concepts and principles of strategic management analyse the internal and external environment of business
- To Develop and prepare organizational strategies that will be effective for the current business environment
- To grasp the importance of strategic analysis and apply various methods used for the analysis
- To Devise strategic approaches to managing a business successfully in a global continues.
- To critically evaluate and analyze case studies

**P22HACC42- STRATEGIC MANAGEMENT**

**MAPPING**

CO – PO -PSO matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

**M.Sc Hospital Administration**

PO-PSO-CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3





## **P22HAVAC2 - MEDICAL EQUIPMENTS**

### **COURSE OBJECTIVES:**

- The use of medical devices is an increasingly important element of a healthcare professional's role. It is crucial that users receive regular teaching and education to ensure that they are competent in the use of devices. This is particularly relevant in the increasingly litigious society in which we live.

### **UNIT – I**

Bio-medical equipment's – requirements – function – allocation to various therapeutic and investigative departments.

### **UNIT – II**

Radiology: X-ray –fluoroscopy – CT – MRI-PET SCAN. /Biochemistry – Calorimeter – flame Phytomer – Spectrometer – Coulter counter – Blood gas analyser – Auto analyser. Physiotherapy: Muscle stimulator – short wave diathermy – ultrasonic and microwave diathermy.

### **UNIT – III**

Urology – haemodialysis – lithotripsy. / Cardiology – ultrasound scanner and Echo cardiogram Angiogram – Tread Mill –ECG monitor and recorder. /Neurology – EEG – EMG – VEP. /ENT: Audiometer. /Cardiac care Unit – pacemakers – defibrillator – ventilator – infusion pumps – patient monitoring system. /Ophthalmology: Fundus camera – Nd – YAG & argon lasers – perimeter.

### **UNIT – IV**

Operation Theatre – ECG monitor – anaesthesia machine – pulse oximeter suction apparatus – endoscopes – electrosurgical unit – heart lung machine – oxygenators – autoclave – sterilisers.

### **UNIT – V**

Maintenance – preventive – breakdown. Electrical safety of medical equipment's – accident prevention – diagnosis – calibration – repair of equipment's – radiation safety – safety precaution – protection methods – hospital safety.

### **UNIT – VI**

**CURRENT CONTOURS** (For continuous internal Assessment only): Medical Equipment's maintains – safety preventive breakdown (presentation) seminar 45

### **REFERENCES:**

1. Hogarth .P.: Glossary of Health care terminology., WHO Regional Office., Europe.
2. Edna Huffman : Medical records Management Record company, Illinois., USA

3. Park K: Park's Text Book of Preventive and Social Medicine., M/s Banaridas, Jabalpur.  
 Khandpur R.S. Hand Book of Biomedical instrumentation, Tata McGraw Hill Publishing co.,  
 Leslee Cromwell: Biomedical Instrumentation and Measurement

4. Park K: Park's Text Book of Preventive and Social Medicine., M/s Banaridas, Jabalpur.

**COURSE OUTCOMES:**

- To understand the medical informatics, classification of medical data, applications of computers in medical fields.
- To Identify various active electronic components
- To recognise quality and effective functioning of hospital equipments
- To Identify health care delivery system in India and role of medical equipments
- To manage the equipment related to patient safety and electoral safety, special techniques for measurement of non-electrical biological parameters

**P22HAVAC2- MEDICAL EQUIPMENTS**

**MAPPING**

CO – PO -matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

**M.Sc Hospital Administration**

PO-CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3
CO2	3	2	2	2	3
CO3	3	2	2	2	3
CO4	3	2	2	2	3
CO5	3	2	2	3	2
Average	3	2.2	2	2.2	2.8





## M.Sc PHYSICS

### Programme Outcome of M.Sc. Physics (PO):

On the successful completion of the M.Sc. Physics Programme, the students will

1. Have a deep knowledge of the fundamental concepts of Physics and understand how the various phenomena in nature follow the laws of Physics.
2. Identify, formulate and analyze the scientific problems using the basic principles.
3. Develop problem-solving skills and have the ability to apply mathematical tools to understand and describe physical problems.
4. Be able to handle the laboratory equipments, gain knowledge about advanced experimental techniques and can successfully interpret results required for research and industrial applications.
5. Acquire effective computational skills to apply them to scientific and technological problems.

  
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FIRST YEAR

SUBJECT CODE: P22PYCC11

SEMESTER -I

CORE COURSE I

CLASSICAL MECHANICS

**UNIT-I: LAGRANGE'S FORMULATION:**

Mechanics of a system of particles – Constraints – Generalized coordinates  
D'Alembert's principle and Lagrange's equations – Simple application of the Lagrangian formulation –  
Hamilton's (variational) principle and derivation of Lagrange's equations –  
Generalized momenta and energy – Cyclic coordinates – Conservation Laws.

**UNIT-II CENTRAL FORCE MOTION AND RIGID BODY DYNAMICS:**

Central Force Motion: General features – The Kepler Problem: inverse square law force – Scattering  
in a central force field. Rigid Body Dynamics: Moment of inertia tensor – Euler angles – Euler's equations  
of motion – Symmetrical top – Problems.

**UNIT-III HAMILTON'S FORMULATION:**

Legendre transformation – Hamiltonian and Hamilton's equation of motion – Properties –  
Derivation of Hamilton's equations from variational principle – Canonical transformation – Applications –  
Poisson brackets – Hamilton Jacobi equation for Hamilton's principle function – Hamilton's  
characteristic function – Application (Harmonic Oscillator) – Action-angle variables – Problems.

**UNIT-IV SMALL OSCILLATIONS AND VIBRATIONS:**

Small Oscillations: Theory of Small Oscillations – Eigenvalue Problem –  
Normal modes and Normal frequencies – Frequencies of Free vibrations – Normal coordinates – Examples –  
Two coupled Pendula – Linear triatomic molecule – Forced Vibrations.

**UNIT-5 THEORY OF RELATIVITY**

Inertial and non-inertial reference frames – Addition of velocities, mass, energy – Mass-Energy  
Equivalence – Pseudo Forces – Galilean and Lorentz transformations – Invariance of Maxwell's equations  
under Lorentz transformation – Lagrangian and  $H$  to provide depth knowledge the foundations  
Classical Mechanics.



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**UNIT-6 CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**Nonlinear Dynamical Systems - Linear Stability Analysis – Classification of Fixed points. Hamilton's principle and Lagrange's equation to electrical systems – Dynamics of gyroscopes – Multibody dynamics and robotics.**

**COURSE OUTCOME**

1. To provide in-depth knowledge on the foundations of Classical Mechanics.
2. To familiarize the laws of motion and learn about their applications in other branches of Physics.
3. To build a strong base on dynamical systems.
4. To understand the canonical and Lorentz transformations
5. To illustrate the dynamics of a rigid body.

**FIRST YEAR**

**Semester: I**

**Subject Code: P22PYCCPII**

**CORE COURSE I - CLASSICAL MECHANICS**

**MAPPING**

**CO - PO matrices of course**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	3	3	3	2	1
CO2	3	3	2	2	2	2	2
CO3	3	2	2	2	3	2	2
CO4	3	2	2	2	3	3	1
CO5	2	-	1	1	2	3	2
optimum point	3	2	2	2	3	2	2

  
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**CORE COURSE II****MATHEMATICAL PHYSICS****UNIT-I VECTOR CALCULUS:**

Vector integration – Line integral – Path independence – Surface integral – Flux – Volume integral – Green's theorem – Stokes' theorem – Divergence theorem – Orthogonal curvilinear coordinates – Unit vectors in curvilinear coordinate system – Gradient, divergence, curl and Laplacian in cylindrical and spherical polar coordinates.

**UNIT-II MATRICES:**

Matrix algebra – Solution of a system of linear equations – Properties of (i) symmetric, (ii) anti-symmetric, (iii) orthogonal, (iv) Hermitian, (v) skew-Hermitian and (vi) unitary matrix

– Eigenvalues and eigenvectors of a square matrix – Diagonalization – Matrix Analysis of Single<sup>th</sup> order differential equation and system of second order linear differential equations and their solutions.

**UNIT-III ORDINARY DIFFERENTIAL EQUATIONS:**

Methods of finding solutions of first and second order ordinary differential equations (ODEs) with constant coefficients – Initial value and boundary value problem – Methods of finding solutions – Superposition principle – Wronskian – Definition of ordinary and singular points of second order ODEs – Power series solution – Examples – Solutions about ordinary point and singular point in power series.

**UNIT-IV SPECIAL FUNCTIONS:**

Sturm-Liouville problem – Basic properties – Need for studying Sturm-Liouville problems in physics – Specific examples for Sturm-Liouville equation: (i) Legendre, (ii) Hermite and

(iii) Laguerre differential equations – Power series solutions – Polynomials – Generating function – Rodrigue's formula – Recursion relations – Orthogonality relations.

**UNIT-V PROBABILITY:**

Definition – Addition rule of probability – Multiplication law of probability – Probability Distribution – Binomial Distribution – The First Four Moments Of Binomial Distribution – Poisson Distribution – Normal Distribution – The first four moments of Poisson and Normal distribution – Applications Of Binomial, Poisson and Normal distributions – Central Limit Theorem.

**UNIT-VI CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**Beta, Gamma and Delta functions – Concepts of regression, dimensionality reduction,density estimation and classification–Linear Filter Sand Wavelets.**

**COURSEOUTCOME:**

**On the successful completion of the course, students will be able to**

- 1. Acquire the essential mathematical skills to solve problems in various branches of Physics.**
- 2. Understandtheusefulnessofvectorintegrationtheoremsandtheirutilityinsolvingphysicsproblems a risinginelectromagnetictheoryandotherbranchesofphysics.**
- 3. Knowtheusefulnessofmatricesandmatrixoperationsinsolvingphysicsandengineeringproblems.**
- 4. Attain sound knowledge of classicalorthogonalpolynomialsandtheirapplicationsinquantumphysics**
- 5. Solvevariouskindsofdifferentialequationsthatmodelavarietyofnaturalsystems.**

**Year: I**

**Semester: I**

**Subject Code: P22PYCCP12**

**CORE COURSE I - MATHEMATICAL PHYSICS**

**MAPPING**

**CO - PO – matrices of course**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>CO4</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>CO5</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>
<b>optimal point</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>

  
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**CORE COURSE II**  
**ANALOG AND DIGITAL ELECTRONICS**

**UNIT-I SEMICONDUCTOR DEVICES:**

SCR-DIAC-TRIAC-Construction,operation-Characteristics-Tunnel diode-Gunn diode-V-I characteristics.Basic monolithic ICs-Epitaxial growth  
- Masking-Etching-Impurity Diffusion-Fabricating Monolithic Resistors, diodes, transistors, inductors and capacitors - Circuit layout - Contacts and interconnections.

**UNIT-II OPERATIONAL AMPLIFIER:**

Wien bridge and phase-shift oscillators-Triangular, saw-tooth and square-wave generators - Schmitt trigger - Voltage controlled oscillator - Phase-locked loops - Weighted resistor and binary R-2R ladder D/A converters-Counter type and successive approximation A/D converters-Solving simultaneous and differential equations.

**UNIT-III 555 TIMER AND PHASE LOCKED LOOP:**

Introduction - Description and functional diagram of 555 timer - Monostable Operation - Frequency divider Astable operation - Frequency Shift Keying (FSK) generator. PLL Basic principle - Analog phase detector - Digital phase detector - PLL applications-Frequency Multiplication/division.

**Unit-IV Digital Circuits-I:**

Digital comparator - Parity generator/checker - Data selector - BCD to decimal decoder - Seven segment decoder - Encoders - RS, JK, D, T and JK master-slave flip-flops.

**UNIT-V DIGITAL CIRCUITS-II:**

Serial-in serial-out, Serial-in parallel-out Parallel-in serial-out shift registers  
- Synchronous, asynchronous, ring and up/down (using mod 10) counters-Multiplexers-Demultiplexers.

**UNIT-VI CURRENT CONTOURS(For continuous internal assessment only):**

Nanoelectronic Circuits-New Ohm's law-Energy Harvesting- High speed electronic memories- Transmission Lines.

  
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## COURSEOUTCOME:

On the successful completion the course,students will be able to

1. Understand the basic principle and the underlying concepts of electronic devices.
2. Gain a clear understanding of the operations of electronic circuits.
3. Design and analyze electronic circuits.
4. Learn the applications of the operational amplifier and IC 555 and demonstrate the mintimer.
5. Realize the digital circuits and communication circuits.

Subject Code: P22PYCCIA

### CORE COURSE I - ANALOG AND DIGITAL ELECTRONICS


#### MAPPING

#### CO - PO – matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	3	2	1	2	1
CO2	2	2	3	2	2	2	2
CO3	3	2	2	2	2	1	1
CO4	3	2	2	1	1	2	2
CO5	3	3	2	1	2	2	1
optimal point	3	2	2	2	2	2	1

  
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First Year                      ELECTIVE COURSE I                      Semester I

**COMPUTATIONAL PHYSICS WITH C++**

Code: P22PYE1A                      (Theory)                      Credit: 4

**Objectives:**

**To impart knowledge of curve fitting, interpolation, and linear and nonlinear equations.**

**To familiarize numerical integration and differentiation.**

**To provide the knowledge of C ++ language constructs.**

**UNIT-I      THEORY OF EQUATIONS, THEIR ROOTS AND CURVE FITTING:**

**Descartes Rules Signs-Cardan method of solving cubic and bi Quadratic Equation - Roots of algebraic and transcendental equations: Graphical method – Bisection method – Method of false position – Newton-Raphson method. Curve Fitting: Method of least squares – Normal equations, straight line fit, exponential and parabolic fits.**

**UNIT-II      SOLUTION TO SIMULTANEOUS LINEAR ALGEBRAIC EQUATIONS:**

**Solution using inverse of a matrix – Cramer rule – Gauss elimination method – Jordan Method – Crout Reduction method – Factorization method – Jacobi Iterative Method – Gauss-Seidel iterative method – Solution Tridiagonal System.**

**UNIT-III      INTERPOLATION AND NUMERICAL INTEGRATION:**

**Interpolation: Divided Differences-Lagrange Interpolation Formula. Integration Function: Trapezoidal rule for single integral and Simpson's rule for single integral - 1/3 and 3/8 rules. Integration of ODE: Euler formula – modified Euler formula – Fourth order Runge-Kutta Method.**

**UNIT-IV      FUNDAMENTALS OF C++ LANGUAGE:**

**Object Oriented Programming paradigm – Benefits of OOP - Applications of C++ - Structure of C++ program – Tokens: Keywords, Identifiers and Constants – Basic data types – User-defined data types – Scope resolution operator. Control structures: Decision making with simple if - if-else - nesting of if-else - switch - goto statement - Looping with while-do-while-for statements - break and continue statements - arrays - Library functions - User-defined functions.**

  
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**UNIT-V**

**SPECIAL FEATURES OF C++:**

**Encapsulation–Polymorphism- Classes and objects – Specifying a class –Creating objects – Accessing class members – Defining member functions – Inlinefunctions - Arrays of objects – Objects as function arguments– Returning objects -Friendlyfunctions-Constructors–Destructors–Functionoverloading- Operatoroverloading–Overloadingunaryoperators-Overloadingbinaryoperators– Rulesforoverloadingoperators-Derivedclasses–Inheritance-Files.**

**Unit–VI CurrentContours(Forcontinuousinternalassessmentonly):**

**AdvancedinterpolationmethodsandcertainadvancedfeaturesofC++:Newtondivideddifferenceinterpolati onformulaforunequalintervals - Derivation ofNewtonforwardinterpolationformulafromNewtondivideddifferenceformula.**

**COURSEOUTCOME:**

**Onthesuccessfulcompletion Ofthe Course,students will beable to**

- 1. Know About Curve Fitting,interpolation,and linear and nonlinear equations.**
- 2. Numerically integrate and differentiate.**
- 3. Use C++ language constructs for numerical computation.**
- 4. Apply numerical methods to solve and visualize physical problems.**
- 5. Develop an idea to write a programme using python.**

  
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**ELECTIVE COURSE-I**  
**COMPUTATIONAL PHYSICS WITH C++**

Subject Code: P22PYE1A

**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	3	2	2	1	3
CO2	3	3	3	3	1	2	2
CO3	3	3	3	3	2	2	1
CO4	2	3	3	2	2	2	2
CO5	-	1	1	-	1	-	-
optimal point	3	3	3	2	2	2	2

  
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Year: I  
Subject Code: P22PYCC21

Semester: II

**CORE COURSE III**  
**QUANTUM MECHANICS**

(Theory)

**Objectives:**

- To enhance the knowledge of the foundations of Quantum Mechanics.
- To get acquainted with solving problems using the Schrödinger equation.
- To provide a basic understanding of state vectors in abstract representation.

**UNIT-I FOUNDATIONS OF QUANTUM MECHANICS:**

Equations of motion of matter waves: Postulates of Quantum mechanics -  
Time independent Schrödinger equation, Time dependent Schrödinger equations -  
Physical interpretation of wave function - Normalized and orthogonal wave functions -  
Solution of Schrödinger equation - Stationary states solutions - Expectation value of dynamical quantities -  
Probability current density - Ehrenfest's theorem - Wave packets.

**UNIT-II EXACTLY SOLVABLE SYSTEMS:**

The Free particle - One and three dimensional Harmonic oscillator - Particle in a box - Rigid rotator with free axis, with fixed plane - Hydrogen atom - Rectangular Potential Barrier - Square Well Potential.

**UNIT-III LINEAR VECTOR SPACE AND FORMULATION OF QUANTUM MECHANICS:**

Linear vector space - The Hilbert space, Dimensions and basis - Operator and properties -  
Representation of vectors and operators, Commutator, Function of operator, Eigenvalue and Eigenvector -  
Matrix representation of bras, kets, and operator -  
Coordinate and momentum representation and their connection - Projection operator.

**UNIT-IV ANGULAR MOMENTUM:**

Angular momentum operators - The rotation operator and angular momentum -  
Spin angular momentum - Total angular momentum operator - Commutation relation -  
Eigenvalue of angular momentum operator - Matrix Representation - Addition of angular momentum -  
Clebsch-Gordan coefficients.

  
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## UNIT-V PARTICLES SPIN:

Physical meaning of identity – Symmetric and antisymmetric wave functions – Exchangedegeneracy – Particle Exchange Operator – Distinguishability Identical Particle – The Pauli exclusion principle – Spin angular momentum – Electron Spin Hypothesis – (Pauli) spin matrix for electron – Commutation Relations – Two component wave function – Pauli operator – Pauli Eigenvalues and Eigenfunction – Electron-spin formulation – Spin matrix and Eigenmatrix – Spin matrices and Eigenfunctions.

## UNIT-IV CURRENT CONTOURS (For continuous internal assessment only):

Time Dependence Of Density Matrix – Symmetry Nanti-symmetric wave functions of hydrogen molecule. Concepts of Quantum circuits, computation and information.

## COURSE OUTCOMES:

On the successful completion Of the Course, students will be able to

1. Understand the foundations of Quantum Mechanics.
2. Develop skills to solve Schrödinger's equation with various potentials.
3. Familiarize with the Dirac notations and operator algebra.
4. Acquire knowledge about the theory of identical particle and spins.
5. Learn quantum mechanical angular momentum theory.



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Year: I

Semester: II

SubjectCode:P22PYCC21

**CORECOURSEIII**

**QUANTUM MECHANICS**

**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>-</b>	<b>-</b>
<b>CO3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>2</b>	<b>2</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>CO5</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>-</b>	<b>2</b>
<b>optimal point</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>

  
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**ELECTRO MAGNETIC THEORY**

Code: P22PYCC22

(Theory)

**COURSE OBJECTIVES:**

To impart an understanding of the fundamental aspects of electromagnetic theory.

To build a strong base in Maxwell's equations.

To Bestow Knowledge About Dispersion and scattering of electromagnetic waves.

**UNIT-I ELECTROSTATICS, MAGNETOSTATICS AND ELECTROMOTIVE FORCE:**

Coulomb's law-Gauss's law in differential form-Poisson's equation-Laplace's equation-Work and energy in electrostatics- Energy of a point charged distribution-Dielectrics-Induced dipoles-Gauss's Law in the presence of dielectrics.Lorentz force-Biot-Savart Law-Divergence and curl of  $\mathbf{B}$ -Ampere's Law-Comparison of magnetostatics and electrostatics - Magnetic vector potential.Ohm's Law-Electromotive force-Faraday's Law-induced electric field  
- Energy In Magnetic Field.

**UNIT-II MAXWELL'S EQUATION AND ELECTROMAGNETIC WAVES:**

Maxwell's equations-Poynting theorem-Wave equation in terms of scalar and vector potential-Transverse nature of electromagnetic wave-Conservation of energy and momentum-Continuity equation - Propagation of plane electromagnetic waves in (a) free space, (b) Isotropic and Anisotropic non-conducting medium and (c) conducting medium-Skin depth-Polarization of electromagnetic waves.

**UNIT-III APPLICATIONS OF ELECTROMAGNETIC WAVES:**

Boundary conditions at the surface of discontinuity - Reflection and refraction of electromagnetic wave at a interface of non-conducting media -Fresnel's Equations - Reflection and transmission coefficients at the interface between two dielectric media-Brewster's Law Degree Of Polarization -Total internal reflection.

**UNIT-IV MICROWAVE GENERATION AND WAVEGUIDES:**

Klystron, Magnetron-Travelling Wave Tube -Rectangular and cylindrical waveguides-TM mode-TE mode-TEM mode-Resonant cavities.

  
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## UNIT-V DISPERSION AND SCATTERING OF ELECTROMAGNETIC WAVES:

Normal and Anomalous dispersion – Dispersion in Gases –  
Experimental demonstration of Anomalous dispersion in gases – Solids and Liquids –  
Clausius-Mossotti relation – Lorentz formula – Scattering and scattering parameters –  
Theory of scattering of electromagnetic waves – Polarization of scattered light –  
Coherence and incoherence of scattered light.

## UNIT-VI CURRENT CONTOURS (For continuous internal assessment only):

Introduction - Conditions for plasma existence – Occurrence of plasma – Magnetohydrodynamics –  
Magnetic confinement - Pinch Effect - Instabilities - Plasma waves. Waves in guiding structures – Emission  
Electromagnetic Waves – Cellular phone Applications – Electromagnetic Tunnelling - Photonic Crystals.

### COURSE OUTCOME:

On The Successful Completion Of The Course, students will be able to

1. Describe The Fundamentals Of Electro And Magnetostatics.
2. Understand Maxwell's equations, and scalar and vector potentials.
3. Acknowledge the applications of electromagnetic waves to reflection and refraction.
4. Describe The Application Of Dispersion and scattering of electromagnetic waves.
5. Realize the existence of plasma, and understand the fundamentals of magnetohydrodynamics.

  
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Year: I

Semester: II

SubjectCode:P22PYCC22

CORECOURSEIV

**ELECTRO MAGNETIC  
THEORY**

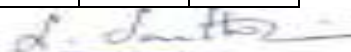
**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate  
(Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	3	2	1	2	1
CO2	3	2	3	2	2	2	2
CO3	3	2	3	2	2	2	2
CO4	3	3	2	2	2	2	2
CO5	2	2	3	1	2	2	1
optimal point	3	2	3	2	2	2	2

  
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First Year

Semester II

**CORE CHOICE COURSE II**  
**ADVANCED MATHEMATICAL PHYSICS**

Code: P22PY22CA

(Theory)

Credit: 5

**COURSE OBJECTIVES:**

To give a strong mathematical foundation linear vector space, tensor and complex analysis.

To provide a basic understanding of hypergeometric functions.

To impart knowledge on applying group theory to physical problems.

**UNIT-I LINEAR VECTOR SPACE:**

Definition of linear vector space – Examples – Linear independence – Basis and dimension of a vector space – Scalar product – Schwartz Inequality – Orthogonality of vectors – Linear transformations – Linear operator – Matrix representation of a linear operator.

**UNIT-II TENSORS:**

Tensors – Rank of the Tensors – Covariant and Contravariant Tensors – Mixed Tensors – Symmetric and Anti-symmetric Tensors – Invariant Tensors – Kronecker Delta – Levi Civita Symbol – Contraction – Tensor Product – Exterior Product – Metric Tensor – Application – Stress and Strain Tensors – Polarizability Tensor – Dynamics Of Rigid Bodies.

**UNIT-III COMPLEX ANALYSIS:**

Complex variables and functions – Analytic functions – Cauchy-Riemann conditions with proof – Complex integration – Cauchy's integral theorem and integral formula – Taylor's and Laurent's series – Residues and Singularities – Poles – Cauchy's residue theorem – Computations of Residue – Evaluation of the definite integrals – Principal value integrals.

**UNIT-IV HYPERGEOMETRIC FUNCTION:**

Hypergeometric series – Elementary Properties of Hypergeometric function – Integral representation of Hypergeometric function – Solution of Hypergeometric differential equation – Confluent Hypergeometric function – Properties of confluent Hypergeometric function – Representation of various functions in terms of Hypergeometric and confluent Hypergeometric functions.



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## UNIT-V GROUP THEORY:

Definition of Group theory – Group table – Sub Group – Classes – Isomorphism and Homomorphism – Schur's Lemma – Orthogonality theorem – The character of representation – Reducible and Irreducible – Formation of character table – Point Groups – n-ary ideas of rotation Groups.

## UNIT-VI CURRENT CONTOURS (For continuous internal assessment only):

Solving three dimensional inhomogeneous differential equations using Green's functions technique - Fourier spectrum analysis for real time data of nonlinear phenomenon like Tsunami waves and unusual seasonal data - Evaluation of integrals using residues for natural phenomena.

### COURSE OUTCOME:

On the successful completion of the course, students will be able to

1. Develop the essential mathematical skills to solve problems in various branches of physics.
2. Explain the usefulness of linear vector space and tensors in physics.
3. Understand the usefulness of complex analysis that arise in various physical systems.
4. Illustrate the properties of hypergeometric functions and their applications.
5. Apply group theory to various physical problems.



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Year: I

Semester: II

SubjectCode:P22PYCCA

CORECOURSEIV

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	1	2	3	1
CO2	3	3	3	-	1	2	3
CO3	2	3	2	2	3	2	2
CO4	3	2	2	1	-	2	2
CO5	3	2	2	1	2	1	2
optimal point	3	2	2	1	2	2	2

  
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First Year

ELECTIVE COURSE II

Semester II

**MICROPROCESSOR AND MICROCONTROLLER**

Code: P22PYE2A

(Theory)

Credit: 4

**COURSE OBJECTIVES:**

To learn the architecture and programming and applications of Intel 8085.

To know the various peripheral devices and interfacing applications.

To understand the architecture and programming, and applications of Intel 8051.

**UNIT-I MICROPROCESSOR ARCHITECTURE AND INTERFACING:**

Intel 8085 microprocessor architecture – Pin configuration – Instruction cycle – Timing diagram – Instruction and data formats – Addressing modes – Memory mapping and I/O mapping I/O scheme - Memory mapping I/O interfacing - Data transfer schemes - Synchronous and asynchronous data transfer – Interrupt driven data transfer - Interrupts of Intel 8085.

**UNIT-II ASSEMBLY LANGUAGE PROGRAMS(8085 ONLY):**

BCD arithmetic - Addition and subtraction of two 8-bit and 16-bit numbers - Largest and smallest numbers in a data set – Ascending order and descending order – Sum of a series of 8-bit numbers – Sum of a series of multi-byte decimal numbers – Square root of a number – Block movement of data - Time Delay – Square-wave generator.

**UNIT-III PERIPHERAL DEVICES AND MICROPROCESSOR APPLICATIONS:**

Generation control signals for memory and I/O devices - I/O ports - Programmable peripheral interface - Architecture of 8255A - Control Word - Programmable interrupt controller (8259) - Programmable counter - Intel 8253 - Architecture, control word and operation – Block diagram and interfacing of analog to digital converter (ADC 0800) – Digital to analog converter (DAC 0800) – Stepper motor – Traffic Control.

**UNIT-IV MICROCONTROLLER 8051:**

Features of 8051 – Architecture – Pin configuration – Memory organization -- External data and program memory - Counters and timers – Serial data Input/output - Interrupt structure – External interrupts – Addressing modes - Comparison between microprocessor and microcontroller.

  
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## **UNIT-V 8051 INSTRUCTION SET AND PROGRAMMING:**

**Instruction Set–Data transfer, arithmetic and logical instructions–Boolean Variable manipulation instructions – Program and machine control instructions –Simple programs – Addition and subtraction of two 8-bit and 16-bit numbers –Division–Multiplication–Largest number in a set–Sum of a set of numbers.**

## **UNIT–VI CURRENT CONTOURS(For continuous internal assessment only):**

**Discussion and demonstration of water level indicator–Security alarm–EVM–Microprocessor system design–FPGAs–Embedded systems–Raspberry Pi.**

## **COURSE OUTCOMES:**

**On The Successful Completion Of The Course, students will be able to**

- 1. Appreciate the use of microprocessors and microcontrollers in the basics of Modern computation.**
- 2. Familiar with the basic concepts of assembly language programming of 8085 microprocessor and microcontroller.**
- 3. Design circuits for various mathematical operations using Op-Amps.**
- 4. Apply the mnemonics of 8085 to write microprocessor programs.**
- 5. Explain the working and design of various A/D and D/A convertors.**

  
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Year: I

Semester: II

SubjectCode:P22PYE2A

ELECTIVE COURSE


**MICROPROCESSOR AND  
MICROCONTROLLER  
MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate  
(Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	2	3	2	2	2
CO2	3	3	2	3	2	2	2
CO3	2	-	-	-	-	-	-
CO4	3	3	3	3	2	2	2
CO5	3	3	3	2	2	2	2
optimal point	3	2	2	2	2	2	2

  
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Second Year

CORE COURSE VI

Semester III

**SOLID STATE PHYSICS**

Code: P22PYCC32

(Theory)

Credit: 5

**COURSE OBJECTIVES:**

To give exposure to structural properties of crystals and the X-ray diffraction principle.

To enhance understanding of the properties of conductors and semiconductors.

To build a strong foundation for the materials' lattice dynamics and thermal, dielectric and electrical properties of materials.

**UNIT-I CRYSTAL STRUCTURE:**

Crystal symmetry – symmetry elements – symmetry operations – Bravais lattices – Miller indices – X-ray diffraction – Bragg's law – Experimental methods of X-ray diffraction: Rotating crystal method and Debye – Scherrer powder method. Scattered wave amplitude: Fourier analysis – reciprocal lattice vector – Diffraction condition – Laue equations – Brillouin zones – reciprocal lattices to SC and BCC lattices – structure factor of BCC lattice – Atomic form factor.

**UNIT-II CONDUCTORS AND SEMICONDUCTORS:**

Conductors: Free electron theory – Classical and Quantum theory – Band theory of solids – Density of States – K-space – Bloch theorem – Kronig-Penney Model – Electrical conductivity and Ohm's law: Experimental electrical resistivity of metals – Umklapp Scattering. Semiconductors: Intrinsic and Extrinsic semiconductors – Band gap – Effective Mass – Carrier Concentration – Electrical Conductivity – Wiedmann-Franz law – Hall effect – Determination of type of conductivity – Carrier Concentration – Mobility – Resistivity.

**UNIT-III MAGNETIC AND DIELECTRIC PROPERTIES:**

Langevin's classical theory of diamagnetism and paramagnetism – Quantum theory of paramagnetism – Weiss Theory of Ferromagnetism – Origin of Domains – Hysteresis

– Domain theory – Curie temperature and Neel temperature. Dielectrics – Macroscopic electric field – Local electric field – Clausius-Mossotti relation – Dielectric Constant Polarizability – Types of Polarization – Determination of dielectric constant – Parallel Plate Method.

  
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#### **UNIT-IV SUPERCONDUCTIVITY:**

**Zeroresistance–Behaviourinmagneticfield–Meissner effect – Heat capacity –Energy gap – Microwave and infrared properties – Isotopic effect –Type I and Type II superconductors–Entropy–Thermal Conductivity–Thermodynamics Of Superconducting transmission - London equations– Coherence Length–BCS theory –Penetration Depth–JosephsonEffect–AC and DC – Quantum tunneling –High T<sub>c</sub>superconductors.**

#### **UNIT-V OPTICAL PROPERTIES AND NEW MATERIALS:**

**Photoconductivity–Simplemodelofphotoconductor–Traps–Influenceoftraps– Luminescenceanditstypes–Photoluminescence–Cathodoluminescence–**

**ChemiluminescenceandThermo-luminescenceandglow curve.Shape Memory alloys**

**–Types–Structure–Temperatureinducedtransformation–Stressinducedtransformation– Functionalproperties–Shapememoryeffect–Superelasticity.**

#### **UNITVI CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**Applicationsofsuperconductors–SQUID-**

**Maglev.Electrontransportinsemiconductorsandnanostructures–Semiconductorquantumwells– Molecularmaterials–Nonlinearoptics.**

#### **COURSE OUTCOMES:**

**On The Successful Completion Of The Course,students willbeableto**

- 1.Applytheknowledgeofcrystalstructuretovarioustypesofcrystallinesolids,electricalandmagnetic materials.**
- 2. Differentiatevarioussolidmaterialsbasedontheirpropertiesandthelearnttheories.**
- 3. Analysethemagneticdielectricandopticalpropertiesofmaterials.**
- 4. Understand The Peculiar properties of superconducting materials.**
- 5. Know new materials and their practical applications.**

  
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## SOLID STATE PHYSICS MAPPING

### CO - PO – matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “- “

### CORECOURSEVI

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	-	1	1	2
CO2	3	2	3	3	1	-	1
CO3	2	1	3	1	3	-	-
CO4	3	1	2	3	3	1	1
CO5	3	2	2	1	2	1	1
optimal point	3	2	2	2	2	1	1

  
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Second Year

CORE CHOICE COURSE III

Semester III

ADVANCED QUANTUM MECHANICS

Code: P22PYCC3A

(Theory)

Credit: 5

COURSE OBJECTIVES

To get acquainted with approximation methods for time-independent and time-dependent Hamiltonians. To provide a sound knowledge of atomic and molecular structure through quantum formalism. To give a basic understanding of the theory of relativistic quantum mechanics.

UNIT-I TIME INDEPENDENT PERTURBATION THEORY:

Stationary theory – Non-degenerate case: First and Second order corrections – Normal Helium atom – Degenerate case: Energy correction – Stark effect in Hydrogen atom and Hydrogen molecule – Zeeman effect without electron spin.

UNIT-II TIME DEPENDENT PERTURBATION THEORY:

Constant perturbation – Transition probability - Fermi Golden Rule – Harmonic perturbation – Adiabatic and sudden approximation. Semiclassical theory of Radiation: Application of the Time dependent perturbation theory to semiclassical theory of radiation.

UNIT-III VARIATION METHOD: Variation principle – Upper bound states – Ground state of Helium atom – Hydrogen Molecule – WKB Approximation – Schrödinger equation – Asymptotic solution – Validity of WKB Approximation – Solution near a turning point – Connection formula for perturbation barrier.

UNIT-IV RELATIVISTIC QUANTUM MECHANICS:

Klein-Gordon equation – Charge and current densities – Interaction with electromagnetic field – Hydrogen like atom – non relativistic limit – Dirac relativistic equation: Dirac relativistic Hamiltonian – Probability density – Dirac matrices – Plane wave solution – Eigenspectrum – Spin of Dirac particle – Significance of negative eigenstate – electron in a magnetic field – Spin magnetic moment.

UNIT-V MANY ELECTRON SYSTEMS:

The Hartree-Fock self-consistent field method – Electron correlation – The atomic Hamiltonian – The Condon-Staterules – The Born-Oppenheimer Approximation – The Hydrogen molecule ion – Approximate treatment of  $H_2^+$  ground state – Molecular orbital theory – The Hydrogen molecule ion –  $H_2^+$ .S

  
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**UNIT-VI CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**LagrangianandHamiltonian formulation of classical fields – Quantization of fields – Quantization of the Schrödinger equation – Klein Gordan and Dirac field –Quantization Of Electromagnetic Fields.**

**COURSE OUTCOMES:**

**Onthesuccessfulcompletion Ofthe Course,students willbeableto**

- **1. Understand Three Approximation Methods.**
- **2. Computethecorrectioninenergyusingtheapproximationtechnique.**
- **3. Applytheapproximationmethodtothestationarystateproblem.**
- **4. Appreciate The Relativistic Effect In Quantum Mechanics.**
- **5. Acquirebasicknowledgeofatomicandmolecularstructures.**

**Year: II**

**Semester: III**

**Subject Code:P22PYCC3A**

**CORECHOICECOURSEIII**

**ADVANCED QUANTUM**

**MECHANICS**

**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate  
(Medium) 3: Substantial (High)  
If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	1	-	2	-	3
CO2	3	2	2	2	3	2	2
CO3	2	2	2	1	2	1	-
CO4	2	2	1	3	3	1	2
CO5	3	2	1	2	3	1	2
optimal point	3	2	1	2	3	1	2

  
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## PHYSICS OF NANOMATERIALS

Code:P22PYE3A

(Theory)

Credit:4

## COURSE OBJECTIVES:

- To provide an introduction to nanomaterials and their peculiar properties.
- To describe various techniques for the preparation of nanomaterials.
- To introduce various applications and characterization techniques.

## UNIT-I INTRODUCTION TO NANOTECHNOLOGY:

Emergence of nanotechnology – Nanomaterials –  
 Classification of nanomaterials based on composition, number of dimensions in nanoscale and morphology –  
 Characteristics of nanomaterials – Surface area to volume ratio – Its effect on properties of nanomaterials –  
 Nanoparticles – Nanoclusters – Nanocomposites – Nanohybrids.

## UNIT-II QUANTUM DOTS AND CARBON NANOTUBES:

Quantum dots (QDs) – Excitons confinement in quantum dots – Production and applications of QDs –  
 Quantum wires – Quantum wells – Carbon allotropes – Discovery of C<sub>60</sub> – Fullerenes – Types of fullerenes –  
 Bucky balls – Carbon nanotubes (CNTs) – Single walled CNTs – Multi-walled CNTs – Properties of  
 CNTs – Synthesis of CNTs – Plasma-arc discharge method – Laser ablation technique –  
 Chemical vapour deposition method – CNT emitters – Potential applications of CNTs.

## UNIT-III PREPARATION OF NANOMATERIALS:

Nanomaterials preparation: Top-down method – Working principles, merits and demerits of Ball milling –  
 Photolithography – Electron beam lithography – Molecular beam epitaxy – Bottom-up technique – Soft-  
 chemical method – Sol-gel synthesis – Electrochemical deposition – Atomic layer deposition – Langmuir  
 - Blodgett film (2D nanostructure) preparation – Green synthesis.

## UNIT-IV ANALYTICAL TECHNIQUES FOR NANOMATERIALS CHARACTERIZATION

Structural characterization: Principle of X-ray powder diffraction –  
 Determination of structural parameters – Optical studies: UV-Vis-NIR spectrometry –  
 Band gap determination by Tauc's plot method – Surface morphological analysis:  
 Scanning electron microscopy (SEM) – Scanning tunnelling microscope (STM) –  
 Transmission Electron Microscope (TEM) – X-ray photoelectron spectroscopy (XPS).

## **UNIT-V APPLICATIONS OF NANOMATERIALS:**

**Nanoelectronics – Molecular diodes and transistors – Quantum electronic devices –Nanophotonics– Photonic Crystals–Nanoelectromechanical Systems(NEMS)–Nanomaterials in energy conversion and storage – Nanomaterials as antibacterial agents –Nanomaterials as photo catalysts – Energy efficient windows – Nanomaterial Industrial Applications–Bio-medical applications:Targeted Drug Delivery.**

## **UNIT-VI CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**Potential applications of nanomaterials: CNTs Air and Water Filtration - ConductivePlastics– Conductiveadhesives-CNTceramicmaterials–Nanoporousfilters- Electrontransportinsemiconductorsandnanostructures–Nanostructuredevices.**

## **COURSE OUTCOMES:**

**On The Successful Completion Of The Course,students will beableto**

- 1. ExplainhowtheNano-sized materials differ from bulk materials.**
- 2. Classify the synthesizing techniques suitable for different Nano-structuredmaterials.**
- 3. Makeuseoftheavailableinstrumentstostudythepropertiesofnanomaterials.**
- 4. Assess theeffectofgrain sizesonvariouspropertiesofnanomaterials.**
- 5. Interpret The Results of physical and chemical properties measurements.**



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Subject Code:P22PYE3A

**ELECTIVE COURSE III**

**PHYSICS OF NANO MATERIALS**

**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate  
(Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO5</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>optimal point</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>

  
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Second Year

CORE COURSE VII

CRYSTAL GROWTH AND THIN FILM PHYSICS

Semester IV

Code: P22PYCC41

(Theory)

Credit: 5

**COURSE OBJECTIVES:**

To introduce the knowledge of crystal growth and its characterization.

To Understand The Basic Ideas Of Thin Film Fabrication.

To impart knowledge about working principles of various analytical techniques.

**UNIT-I NUCLEATION THEORIES:** Importance of crystal growth – Classification of crystal growth methods – Nucleation Theory – Kinds of nucleation – Homogeneous nucleation – Heterogeneous nucleation – Secondary nucleation – Classical theory of nucleation: Gibbs Thomson equations for vapour and solution – Kinetic theory of nucleation – Becker and Doring concept on nucleation rate – Energy of formation of a spherical nucleus –

Statistical theory on nucleation: Equilibrium concentration of critical nuclei, Free energy of formation. **UNIT-II**

**CRYSTAL GROWTH TECHNIQUES:** Growth from low temperature solution: Selection of solvent and solubility – Meir's solubility diagram – Saturation and supersaturation – Metastable zone width – Meir's solubility diagram – Saturation and supersaturation – Metastable zone width – Growth by restricted evaporation of solvent, slow cooling of solution and temperature gradient methods – **Gel Growth Technique:** Principle – Various types – Structure of gel – Importance of gel – Experimental procedure – Chemical reaction method – Single and double diffusion method. **Melt Growth Techniques:** Bridgman technique – Czochralski technique – Verneuil method – Merits and demerits.

**UNIT-III FUNDAMENTALS AND APPLICATIONS OF THIN FILMS:**

Introduction – Advantages of thin film devices over their bulk counterparts – Thin film growth stages: Nucleation stage – Island stage – Coalescence stage – Channel, hole and continuous film stage – Properties of thin films: Sheet resistance – Porosity – Surface roughness – Adhesion – Application of thin films: Thin films in photovoltaic technologies dye sensitised solar cells – Thin films in electronic devices – Thin films in disinfectant technologies – Optical coatings – Chemical and mechanical applications.

**UNIT-IV PHYSICAL DEPOSITION AND CHEMICAL DEPOSITION METHODS:**

Basic of vacuum – Physical Vapour Deposition (PVD) – Thermal evaporation – Electron beam evaporation – Pulsed Laser Ablation – Molecular Beam Epitaxy – Sputtering techniques – DC and RF sputtering – Ion plating – Chemical methods – Electrodeposition and electroless plating – Chemical bath deposition – Spray pyrolysis – Spin coating – Dip coating – SILAR – Electrospinning – Hydrothermal – Sol-gel synthesis – Metalorganic (Chemical vapour deposition).



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## **UNIT-V CHARACTERISATION TECHNIQUES:**

**X-Ray Diffraction (XRD) – Powder and single crystal – Fourier transform Infrared – Raman analysis (FT-IR) – UV-Visible spectrometer – Photoluminescence - Vickers Microhardness- Chemical Etching- Surface Profilometry -Energy dispersive analysis of X-ray (EDAX) – Atomic force microscopy (AFM) – Thermo Analysis (TGA) – Differential Thermal Analysis (DTA).**

## **UNIT-VI CURRENT CONTOURS (For continuous internal assessment only):**

**Demonstration of solution growth instruments and solubility measurements - Demonstration of vertical Bridgmann growth and Czochralski growth process and ampoule designing for Bridgmann growth - Demonstration of characterisation techniques.**

## **COURSE OUTCOME:**

**On the successful completion of the course, students will be able to**

- 1. Understand the various techniques of crystal growth.**
- 2. Acquire knowledge in the fields of thin films.**
- 3. Gain the knowledge of thin film preparation processes through physical and chemical methods.**
- 4. Know the working principles of characterization techniques.**
- 5. Comprehend the properties and applications of thin films.**

  
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# CRYSTAL GROWTH AND THIN FILM PHYSICS

Year: II

MAPPING

Semester: IV

Subject Code:P22PYCC41

CO - PO – matrices of course

ELECTIVE COURSE III

1:Slight (Low) 2: Moderate (Medium) 3:

Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	2	2	2	3	2
CO2	3	2	2	3	3	2	2
CO3	3	3	2	2	3	2	3
CO4	3	3	2	3	2	3	3
CO5	2	2	3	2	3	3	2
optimal point	3	2	2	2	3	3	2

  
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**NUCLEAR AND PARTICLE PHYSICS**

Code:P22PYCC42

**COURSE OBJECTIVES:**

To provide fundamental features of analytical instrumentation to the students.

To impart knowledge about the fundamental properties of the instrumental analysis and experiment and the theoretical aspects of the characterization techniques.

To know the basic theory of characterization techniques and application.

**UNIT – I TWO BODY PROBLEM AND NUCLEAR FORCES:**

Ground state of the Deuteron - Wave equation for the deuteron and its solution. Excited states of the deuteron, Normalization of the deuteron wave Function, Low energy Neutron – Proton Scattering, Scattering length. Spin dependence of n-p Interaction, Effective range theory. Non-Central Force - Quadrupole moment of the deuteron, Magnetic moment of the deuteron. Neutron-Neutron scattering, Exchange interaction and saturation of the nuclear force.

**UNIT – II NUCLEAR MODELS:**

Constitution of the nucleus- Fermi gas model of the nucleus. Nuclear shell structure-single particle states in nuclei- Spin-orbit interaction. Applications of extreme single particle shell model. Single particle shell model - Individual particle model-Collective model. Liquid drop model-Bohr-Wheeler Theory.

**UNIT – III RADIOACTIVITY:**

Alpha-decay and barrier penetration- Gamow's theory of alpha decay. Beta decay- Pauli's hypothesis- Fermi's theory of  $\beta$ -decay-Selection rules-Parity in  $\beta$ -decay- Helicity of Neutrino-Electron capture. Gamma-rays-Interaction of  $\gamma$  rays with matter-Photo-electric absorption-Electron-Positron pair production-Multipole radiations - Selection rules-Conservation of parity-Internal conversion.

**UNIT – IV NUCLEAR REACTION:**

Types of nuclear reactions- Conservation laws-Nuclear reaction kinematics. Nuclear cross section- Classical analysis of cross-section. Partial wave analysis of reaction cross-section. Inverse reaction- Principle of detailed balance (Reciprocity theorem). Compound nucleus- Disintegration of a Compound nucleus. Resonance cross-sections: Breit-Wigner dispersion formula. Direct reactions-Plane wave Born Approximation Theory of direct interactions. Nuclear Shock waves. Nuclear Reactors- Production reactors, Power reactors-Peaceful Nuclear Explosions- Nuclear Power production in India.



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## UNIT – V ELEMENTARY PARTICLES:

Classification of elementary particles-Conservation laws-CPT Theorem. Graviton, Photon, Gluon. Muons -Production-Nature of muon decay-muon interaction- muonium. Resonance particles, Symmetry classification of elementary particles-


SU(2) Symmetry-SU(3) Symmetry-Gell-Mann-Okubo mass formula for SU(3) multiplets. Quark hypothesis-Quark structures of mesons and baryons. Quantum Chromodynamics. Charmed quark-Beauty and Truth. Higgs Bosons.

## UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):

Neutrinos- Sources of neutrinos – Types of neutrino-Deduction of neutrino- Neutrino Oscillations in matter-Neutrino communication. Scintillation detectors – Positron Emission Tomography – X-ray Computed Tomography – Magnetic Resonance Imaging – Neutrino Telescopes.

### COURSE OUTCOME:

1. To understand Various aspect of nucleus properties.
- 2 Learn about the process of Radioactive Decays.
3. Learn the basic aspects of nuclear reaction.
- 4.To study the Fission and Fusion Reactors.
- 5.To Learn about Particle Physics.

  
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## MAPPING

CO - PO – matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	2	2	2	3	2
CO2	2	3	2	3	3	2	2
CO3	3	2	2	1	3	3	3
CO4	3	2	3	2	2	2	2
CO5	3	2	1	2	3	2	-
optimal point	3	2	2	2	3	2	2

  
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Second Year

Analytical Characterization Techniques

Semester IV

Code:P22PY1BC

(Theory)

Credit: 5

**UNIT - I STRUCTURAL CHARACTERIZATION**

Principle of X-ray spectrometer technique – Small angle X-ray scattering – X-ray photoelectron spectroscopy – Auger relation of core hole – Application, strength and limitations of X-ray photoelectron spectroscopy

**UNIT – II SPECTRAL CHARACTERIZATION:**

Laser sources – Laser Raman Spectrometer – Radiation sources – Fourier Transform Interferometer – NMR basic principles – NMR spectrometer – ESR basic principles – Instrumentation of ESR

**UNIT – III OPTICAL CHARACTERIZATION:**


Instruments for absorption photometry – Photoluminescence principles – Instrumentation and Application – Ultraviolet absorption spectroscopy – Principle behind IR spectroscopy – Fourier Transform Infrared spectroscopy (FTIR) – Strength of FTIR spectroscopy

**UNIT – IV THERMAL AND MECHANICAL CHARACTERIZATION:**

Thermal methods – Thermogravimetric analysis – Differential Thermal analysis – Mechanical principles: Static and Dynamic measurement – Instrumentation of Extensometer analysis – Bending properties of materials – In-Plane Impact testing

**UNIT – V MORPHOLOGICAL CHARACTERIZATION:**

Basic principles – Instrumentations: Scanning Electron Microscopy (SEM) – Operation modes – Transmission Electron Microscopy (TEM) – Scanning Tunneling Microscopy (STM)

  
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**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

**Basic principles – Instrumentations: X-ray photoelectron spectroscopy (XPS) – Ultraviolet photoelectron spectroscopy (UPS) –Brunauer Emmet Teller (BET) theory.**

**Hall effect measurement system – Analytical scanning electron microscope – In- site electrical characterization – Neutron scattering.**

**COURSE OUTCOME:**

- 1.To Gain Knowledge in Structural Characterization.**
- 2.To Study about Spectral Characterization.**
- 3.To understand about optical Characterization.**
- 4.To Know about Thermal Characterization.**
- 5.To Study about Morphological Characterization**

  
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Second Year

Analytical Characterization Techniques

Semester IV

Code:P22PY1BC

(Theory)

Credit: 5

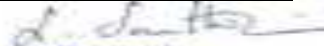
**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	1	2	2	2
CO2	3	3	2	1	3	-	3
CO3	2	2	2	2	-	2	3
CO4	3	1	2	2	2	2	2
CO5	3	-	1	2	1	3	3
optimal point	3	2	2	2	2	2	3

  
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## M.Sc PHYSICS

### Programme Outcome of M.Sc. Physics (PO):

On the successful completion of the M.Sc. Physics Programme, the students will

1. Have a deep knowledge of the fundamental concepts of Physics and understand how the various phenomena in nature follow the laws of Physics.
2. Identify, formulate and analyze the scientific problems using the basic principles.
3. Develop problem-solving skills and have the ability to apply mathematical tools to understand and describe physical problems.
4. Be able to handle the laboratory equipments, gain knowledge about advanced experimental techniques and can successfully interpret results required for research and industrial applications.
5. Acquire effective computational skills to apply them to scientific and technological problems.

  
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FIRST YEAR

SUBJECT CODE: P22PYCC11

SEMESTER -I

CORE COURSE I

CLASSICAL MECHANICS

**UNIT-I: LAGRANGE'S FORMULATION:**

Mechanics of a system of particles – Constraints – Generalized coordinates  
D'Alembert's principle and Lagrange's equations – Simple application of the Lagrangian formulation –  
Hamilton's (variational) principle and derivation of Lagrange's equations –  
Generalized momenta and energy – Cyclic coordinates – Conservation Laws.

**UNIT-II CENTRAL FORCE MOTION AND RIGID BODY DYNAMICS:**

Central Force Motion: General features – The Kepler Problem: inverse square law force – Scattering  
in a central force field. Rigid Body Dynamics: Moment of inertia tensor – Euler angles – Euler's equations  
of motion – Symmetrical top – Problems.

**UNIT-III HAMILTON'S FORMULATION:**

Legendre transformation – Hamiltonian and Hamilton's equation of motion – Properties –  
Derivation of Hamilton's equations from variational principle – Canonical transformation – Applications –  
Poisson brackets – Hamilton Jacobi equation for Hamilton's principle function – Hamilton's  
characteristic function – Application (Harmonic Oscillator) – Action-angle variables – Problems.

**UNIT-IV SMALL OSCILLATIONS AND VIBRATIONS:**

Small Oscillations: Theory of Small Oscillations – Eigenvalue Problem –  
Normal modes and Normal frequencies – Frequencies of Free vibrations – Normal coordinates – Examples –  
Two coupled Pendula – Linear triatomic molecule – Forced Vibrations.

**UNIT-5 THEORY OF RELATIVITY**

Inertial and non-inertial reference frames – Addition of velocities, mass, energy – Mass-Energy  
Equivalence – Pseudo Forces – Galilean and Lorentz transformations – Invariance of Maxwell's equations  
under Lorentz transformation – Lagrangian and Hamiltonian provide depth knowledge the foundations  
Classical Mechanics.



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**UNIT-6 CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**Nonlinear Dynamical Systems - Linear Stability Analysis – Classification of Fixed points. Hamilton's principle and Lagrange's equation to electrical systems – Dynamics of gyroscopes – Multibody dynamics and robotics.**

**COURSE OUTCOME**

1. To provide in-depth knowledge on the foundations of Classical Mechanics.
2. To familiarize the laws of motion and learn about their applications in other branches of Physics.
3. To build a strong base on dynamical systems.
4. To understand the canonical and Lorentz transformations
5. To illustrate the dynamics of a rigid body.

**FIRST YEAR**

**Semester: I**

**Subject Code: P22PYCCPII**

**CORE COURSE I - CLASSICAL MECHANICS**


**MAPPING**

**CO - PO matrices of course**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	3	3	3	2	1
CO2	3	3	2	2	2	2	2
CO3	3	2	2	2	3	2	2
CO4	3	2	2	2	3	3	1
CO5	2	-	1	1	2	3	2
optimum point	3	2	2	2	3	2	2

  
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## CORE COURSE II

## MATHEMATICAL PHYSICS

## UNIT-I VECTOR CALCULUS:

Vector integration – Line integral – Path independence – Surface integral – Flux – Volume integral – Green's theorem – Stokes' theorem – Divergence theorem – Orthogonal curvilinear coordinates – Unit vectors in curvilinear coordinate system – Gradient, divergence, curl and Laplacian in cylindrical and spherical polar coordinates.

## UNIT-II MATRICES:

Matrix algebra – Solution of a system of linear equations – Properties of (i) symmetric, (ii) anti-symmetric, (iii) orthogonal, (iv) Hermitian, (v) skew-Hermitian and (vi) unitary matrix

– Eigenvalues and eigenvectors of a square matrix – Diagonalization – Matrix Analysis of Single<sup>th</sup> order differential equation and system of second order linear differential equations and their solutions.

## UNIT-III ORDINARY DIFFERENTIAL EQUATIONS:

Methods of finding solutions of first and second order ordinary differential equations (ODEs) with constant coefficients – Initial value and boundary value problem – Methods of finding solutions – Superposition principle – Wronskian – Definition of ordinary and singular points of second order ODEs – Power series solution – Examples – Solutions about ordinary point and singular point in power series.

## UNIT-IV SPECIAL FUNCTIONS:

Sturm-Liouville problem – Basic properties – Need for studying Sturm-Liouville problems in physics – Specific examples for Sturm-Liouville equation: (i) Legendre, (ii) Hermite and

(iii) Laguerre differential equations – Power series solutions – Polynomials – Generating function – Rodrigue's formula – Recursion relations – Orthogonality relations.

## UNIT-V PROBABILITY:

Definition – Addition rule of probability – Multiplication law of probability – Probability Distribution – Binomial Distribution – The First Four Moments Of Binomial Distribution – Poisson Distribution – Normal Distribution – The first four moments of Poisson and Normal distribution – Applications Of Binomial, Poisson and Normal distributions – Central Limit Theorem.

**UNIT-VI CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**Beta, Gamma and Delta functions – Concepts of regression, dimensionality reduction,density estimation and classification–Linear Filter Sand Wavelets.**

**COURSEOUTCOME:**

**On the successful completion of the course, students will be able to**

- 1. Acquire the essential mathematical skills to solve problems in various branches of Physics.**
- 2. Understandtheusefulnessofvectorintegrationtheoremsandtheirutilityinsolvingphysicsproblems a risinginelectromagnetictheoryandotherbranchesofphysics.**
- 3. Knowtheusefulnessofmatricesandmatrixoperationsinsolvingphysicsandengineeringproblems.**
- 4. Attain sound knowledge of classicalorthogonalpolynomialsandtheirapplicationsinquantumphysics**
- 5. Solvevariouskindsofdifferentialequationsthatmodelavarietyofnaturalsystems.**

**Year: I**

**Semester: I**

**Subject Code: P22PYCCP12**

**CORE COURSE I - MATHEMATICAL PHYSICS**

**MAPPING**

**CO - PO – matrices of course**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>CO4</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>CO5</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>
<b>optimal point</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>

  
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**CORE COURSE II**  
**ANALOG AND DIGITAL ELECTRONICS**

**UNIT-I SEMICONDUCTOR DEVICES:**

SCR-DIAC-TRIAC-Construction,operation-Characteristics-Tunnel diode-Gunn diode-V-I characteristics.Basic monolithic ICs-Epitaxial growth  
- Masking-Etching-Impurity Diffusion-Fabricating Monolithic Resistors, diodes, transistors, inductors and capacitors - Circuit layout - Contacts and interconnections.

**UNIT-II OPERATIONAL AMPLIFIER:**

Wien bridge and phase-shift oscillators-Triangular, saw-tooth and square-wave generators - Schmitt trigger - Voltage controlled oscillator - Phase-locked loops - Weighted resistor and binary R-2R ladder D/A converters-Counter type and successive approximation A/D converters-Solving simultaneous and differential equations.

**UNIT-III 555 TIMER AND PHASE LOCKED LOOP:**

Introduction - Description and functional diagram of 555 timer - Monostable Operation - Frequency divider Astable operation - Frequency Shift Keying (FSK) generator. PLL Basic principle - Analog phase detector - Digital phase detector - PLL applications-Frequency Multiplication/division.

**Unit-IV Digital Circuits-I:**

Digital comparator - Parity generator/checker - Data selector - BCD to decimal decoder - Seven segment decoder - Encoders - RS, JK, D, T and JK master-slave flip-flops.

**UNIT-V DIGITAL CIRCUITS-II:**

Serial-in serial-out, Serial-in parallel-out Parallel-in serial-out shift registers  
- Synchronous, asynchronous, ring and up/down (using mod 10) counters-Multiplexers-Demultiplexers.

**UNIT-VI CURRENT CONTOURS(For continuous internal assessment only):**

Nanoelectronic Circuits-New Ohm's law-Energy Harvesting- High speed electronic memories- Transmission Lines.

  
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## COURSEOUTCOME:

On the successful completion the course,students will be able to

1. Understand the basic principle and the underlying concepts of electronic devices.
2. Gain a clear understanding of the operations of electronic circuits.
3. Design and analyze electronic circuits.
4. Learn the applications of the operational amplifier and IC 555 and demonstrate the mintimer.
5. Realize the digital circuits and communication circuits.

Subject Code: P22PYCCIA

### CORE COURSE I - ANALOG AND DIGITAL ELECTRONICS


#### MAPPING

#### CO - PO – matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	3	2	1	2	1
CO2	2	2	3	2	2	2	2
CO3	3	2	2	2	2	1	1
CO4	3	2	2	1	1	2	2
CO5	3	3	2	1	2	2	1
optimal point	3	2	2	2	2	2	1

  
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First Year                      ELECTIVE COURSE I                      Semester I

**COMPUTATIONAL PHYSICS WITH C++**

Code: P22PYE1A                      (Theory)                      Credit: 4

**Objectives:**

**To impart knowledge of curve fitting, interpolation, and linear and nonlinear equations.**

**To familiarize numerical integration and differentiation.**

**To provide the knowledge of C ++ language constructs.**

**UNIT-I      THEORY OF EQUATIONS, THEIR ROOTS AND CURVE FITTING:**

**Descartes Rules Signs-Cardan method of solving cubic and bi Quadratic Equation - Roots of algebraic and transcendental equations: Graphical method – Bisection method – Method of false position – Newton-Raphson method. Curve Fitting: Method of least squares – Normal equations, straight line fit, exponential and parabolic fits.**

**UNIT-II      SOLUTION TO SIMULTANEOUS LINEAR ALGEBRAIC EQUATIONS:**

**Solution using inverse of a matrix – Cramer rule – Gauss elimination method – Jordan Method – Crout Reduction method – Factorization method – Jacobi Iterative Method – Gauss-Seidel iterative method – Solution Tridiagonal System.**

**UNIT-III      INTERPOLATION AND NUMERICAL INTEGRATION:**

**Interpolation: Divided Differences-Lagrange Interpolation Formula. Integration Function: Trapezoidal rule for single integral and Simpson's rule for single integral - 1/3 and 3/8 rules. Integration of ODE: Euler formula – modified Euler formula – Fourth order Runge-Kutta Method.**

**UNIT-IV      FUNDAMENTALS OF C++ LANGUAGE:**

**Object Oriented Programming paradigm – Benefits of OOP - Applications of C++ - Structure of C++ program – Tokens: Keywords, Identifiers and Constants – Basic data types – User-defined data types – Scope resolution operator. Control structures: Decision making with simple if - if-else - nesting of if-else - switch - goto statement - Looping with while-do-while-for statements - break and continue statements - arrays - Library functions - User-defined functions.**

  
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**UNIT-V**

**SPECIAL FEATURES OF C++:**

**Encapsulation–Polymorphism- Classes and objects – Specifying a class –Creating objects – Accessing class members – Defining member functions – Inlinefunctions - Arrays of objects – Objects as function arguments– Returning objects -Friendlyfunctions-Constructors–Destructors–Functionoverloading- Operatoroverloading–Overloadingunaryoperators-Overloadingbinaryoperators– Rulesforoverloadingoperators-Derivedclasses–Inheritance-Files.**

**Unit–VI CurrentContours(Forcontinuousinternalassessmentonly):**

**AdvancedinterpolationmethodsandcertainadvancedfeaturesofC++:Newtondivideddifferenceinterpolati onformulaforunequalintervals - Derivation ofNewtonforwardinterpolationformulafromNewtondivideddifferenceformula.**

**COURSEOUTCOME:**

**Onthesuccessfulcompletion Ofthe Course,students will beable to**

- 1. Know About Curve Fitting,interpolation,and linear and nonlinear equations.**
- 2. Numerically integrate and differentiate.**
- 3. Use C++ language constructs for numerical computation.**
- 4. Apply numerical methods to solve and visualize physical problems.**
- 5. Develop an idea to write a programme using python.**

  
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**ELECTIVE COURSE-I**  
**COMPUTATIONAL PHYSICS WITH C++**

Subject Code: P22PYE1A

**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	3	2	2	1	3
CO2	3	3	3	3	1	2	2
CO3	3	3	3	3	2	2	1
CO4	2	3	3	2	2	2	2
CO5	-	1	1	-	1	-	-
optimal point	3	3	3	2	2	2	2

  
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Year: I  
Subject Code: P22PYCC21

Semester: II

**CORE COURSE III**  
**QUANTUM MECHANICS**

(Theory)

**Objectives:**

- To enhance the knowledge of the foundations of Quantum Mechanics.
- To get acquainted with solving problems using the Schrödinger equation.
- To provide a basic understanding of state vectors in abstract representation.

**UNIT-I FOUNDATIONS OF QUANTUM MECHANICS:**

Equations of motion of matter waves: Postulates of Quantum mechanics -  
Time independent Schrödinger equation, Time dependent Schrödinger equations -  
Physical interpretation of wave function - Normalized and orthogonal wave functions -  
Solution of Schrödinger equation - Stationary states solutions - Expectation value of dynamical quantities -  
Probability current density - Ehrenfest's theorem - Wave packets.

**UNIT-II EXACTLY SOLVABLE SYSTEMS:**

The Free particle - One and three dimensional Harmonic oscillator - Particle in a box - Rigid rotator with free axis, with fixed plane - Hydrogen atom - Rectangular Potential Barrier - Square Well Potential.

**UNIT-III LINEAR VECTOR SPACE AND FORMULATION OF QUANTUM MECHANICS:**

Linear vector space - The Hilbert space, Dimensions and basis - Operator and properties -  
Representation of vectors and operators, Commutator, Function of operator, Eigenvalue and Eigenvector -  
Matrix representation of bras, kets, and operator -  
Coordinate and momentum representation and their connection - Projection operator.

**UNIT-IV ANGULAR MOMENTUM:**

Angular momentum operators - The rotation operator and angular momentum -  
Spin angular momentum - Total angular momentum operator - Commutation relation -  
Eigenvalue of angular momentum operator - Matrix Representation - Addition of angular momentum -  
Clebsch-Gordan coefficients.

  
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## UNIT-V PARTICLES SPIN:

Physical meaning of identity – Symmetric and antisymmetric wave functions – Exchangedegeneracy– Particle Exchange Operator–Distinguishability Identical Particle– ThePauliexclusionprinciple–Spin angular momentum –Electron Spin Hypothesis-(Pauli)spinmatrixforelectron–Commutation Relations – Two component wave function – Pauli operator – Pauli Eigenvaluesand Eigenfunction – Electron-spin formulation – Spin matrix and Eigenmatrix –SpinmatricesandEigenfunctions.

## UNIT-IV CURRENT CONTOURS(Forcontinuousinternalassessmentonly):

Time Dependence Of Density Matrix–Symmetry Nanti-symmetric wavefunctions of hydrogen molecule. Concepts of Quantum circuits, computation and information.

## COURSE OUTCOMES:

Onthesuccessfulcompletion Ofthe Course,students willbeableto

1. Understand the foundations of Quantum Mechanics.
2. Develop skills to solve Schrödinger's equation with various potentials.
3. Familiarize with the Dirac notations and operator algebra.
4. Acquire knowledge about the theory of identical particle and spins.
5. Learn quantum mechanical angular momentum theory.



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Year: I

Semester: II

SubjectCode:P22PYCC21

**CORECOURSEIII**

**QUANTUM MECHANICS**

**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>-</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>-</b>	<b>-</b>
<b>CO3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>2</b>	<b>2</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>CO5</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>-</b>	<b>2</b>
<b>optimal point</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>

  
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**ELECTRO MAGNETIC THEORY**

Code: P22PYCC22

(Theory)

**COURSE OBJECTIVES:**

To impart an understanding of the fundamental aspects of electromagnetic theory.

To build a strong base in Maxwell's equations.

To Bestow Knowledge About Dispersion and scattering of electromagnetic waves.

**UNIT-I ELECTROSTATICS, MAGNETOSTATICS AND ELECTROMOTIVE FORCE:**

Coulomb's law-Gauss's law in differential form-Poisson's equation-Laplace's equation-Work and energy in electrostatics- Energy of a point charged distribution-Dielectrics-Induced dipoles-Gauss's Law in the presence of dielectrics.Lorentz force-Biot-Savart Law-Divergence and curl of  $\mathbf{B}$ -Ampere's Law-Comparison of magnetostatics and electrostatics - Magnetic vector potential.Ohm's Law-Electromotive force-Faraday's Law-induced electric field  
- Energy In Magnetic Field.

**UNIT-II MAXWELL'S EQUATION AND ELECTROMAGNETIC WAVES:**

Maxwell's equations-Poynting theorem-Wave equation in terms of scalar and vector potential-Transverse nature of electromagnetic wave-Conservation of energy and momentum-Continuity equation - Propagation of plane electromagnetic waves in (a) free space, (b) Isotropic and Anisotropic non-conducting medium and (c) conducting medium-Skin depth-Polarization of electromagnetic waves.

**UNIT-III APPLICATIONS OF ELECTROMAGNETIC WAVES:**

Boundary conditions at the surface of discontinuity - Reflection and refraction of electromagnetic wave at a interface of non-conducting media -Fresnel's Equations - Reflection and transmission coefficients at the interface between two dielectric media-Brewster's Law Degree Of Polarization -Total internal reflection.

**UNIT-IV MICROWAVE GENERATION AND WAVEGUIDES:**

Klystron, Magnetron-Travelling Wave Tube -Rectangular and cylindrical waveguides-TM mode-TE mode-TEM mode-Resonant cavities.

  
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## UNIT-V DISPERSION AND SCATTERING OF ELECTROMAGNETIC WAVES:

Normal and Anomalous dispersion – Dispersion in Gases –  
Experimental demonstration of Anomalous dispersion in gases – Solids and Liquids –  
Clausius-Mossotti relation – Lorentz formula – Scattering and scattering parameters –  
Theory of scattering of electromagnetic waves – Polarization of scattered light –  
Coherence and incoherence of scattered light.

## UNIT-VI CURRENT CONTOURS (For continuous internal assessment only):

Introduction - Conditions for plasma existence – Occurrence of plasma – Magnetohydrodynamics –  
Magnetic confinement - Pinch Effect - Instabilities - Plasma waves. Waves in guiding structures – Emission  
Electromagnetic Waves – Cellular phone Applications – Electromagnetic Tunnelling - Photonic Crystals.

### COURSE OUTCOME:

On The Successful Completion Of The Course, students will be able to

1. Describe The Fundamentals Of Electro And Magnetostatics.
2. Understand Maxwell's equations, and scalar and vector potentials.
3. Acknowledge the applications of electromagnetic waves to reflection and refraction.
4. Describe The Application Of Dispersion and scattering of electromagnetic waves.
5. Realize the existence of plasma, and understand the fundamentals of magnetohydrodynamics.

  
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Year: I

Semester: II

SubjectCode:P22PYCC22

CORECOURSEIV

**ELECTRO MAGNETIC  
THEORY**

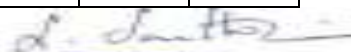
**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate  
(Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	3	2	1	2	1
CO2	3	2	3	2	2	2	2
CO3	3	2	3	2	2	2	2
CO4	3	3	2	2	2	2	2
CO5	2	2	3	1	2	2	1
optimal point	3	2	3	2	2	2	2

  
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First Year

Semester II

**CORE CHOICE COURSE II**  
**ADVANCED MATHEMATICAL PHYSICS**

Code: P22PY22CA

(Theory)

Credit: 5

**COURSE OBJECTIVES:**

To give a strong mathematical foundation linear vector space, tensor and complex analysis.

To provide a basic understanding of hypergeometric functions.

To impart knowledge on applying group theory to physical problems.

**UNIT-I LINEAR VECTOR SPACE:**

Definition of linear vector space – Examples – Linear independence – Basis and dimension of a vector space – Scalar product – Schwartz Inequality – Orthogonality of vectors – Linear transformations – Linear operator – Matrix representation of a linear operator.

**UNIT-II TENSORS:**

Tensors – Rank of the Tensors – Covariant and Contravariant Tensors – Mixed Tensors – Symmetric and Anti-symmetric Tensors – Invariant Tensors – Kronecker Delta – Levi-Civita Symbol – Contraction – Tensor Product – Exterior Product – Metric Tensor – Application – Stress and Strain Tensors – Polarizability Tensor – Dynamics Of Rigid Bodies.

**UNIT-III COMPLEX ANALYSIS:**

Complex variables and functions – Analytic functions – Cauchy-Riemann conditions with proof – Complex integration – Cauchy's integral theorem and integral formula – Taylor's and Laurent's series – Residues and Singularities – Poles – Cauchy's residue theorem – Computations of Residue – Evaluation of the definite integrals – Principal value integrals.

**UNIT-IV HYPERGEOMETRIC FUNCTION:**

Hypergeometric series – Elementary Properties of Hypergeometric function – Integral representation of Hypergeometric function – Solution of Hypergeometric differential equation – Confluent Hypergeometric function – Properties of confluent Hypergeometric function – Representation of various functions in terms of Hypergeometric and confluent Hypergeometric functions.



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## UNIT-V GROUP THEORY:

Definition of Group theory – Group table – Sub Group – Classes – Isomorphism and Homomorphism – Schur's Lemma – Orthogonality theorem – The character of representation – Reducible and Irreducible – Formation of character table – Point Groups – n-ary ideas of rotation Groups.

## UNIT-VI CURRENT CONTOURS (For continuous internal assessment only):

Solving three dimensional inhomogeneous differential equations using Green's functions technique - Fourier spectrum analysis for real time data of nonlinear phenomenon like Tsunami waves and unusual seasonal data - Evaluation of integrals using residues for natural phenomena.

### COURSE OUTCOME:

On the successful completion of the course, students will be able to

1. Develop the essential mathematical skills to solve problems in various branches of physics.
2. Explain the usefulness of linear vector space and tensors in physics.
3. Understand the usefulness of complex analysis that arise in various physical systems.
4. Illustrate the properties of hypergeometric functions and their applications.
5. Apply group theory to various physical problems.

  
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Year: I

Semester: II

SubjectCode:P22PYCCA

CORECOURSEIV

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	1	2	3	1
CO2	3	3	3	-	1	2	3
CO3	2	3	2	2	3	2	2
CO4	3	2	2	1	-	2	2
CO5	3	2	2	1	2	1	2
optimal point	3	2	2	1	2	2	2

  
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First Year

ELECTIVE COURSE II

Semester II

**MICROPROCESSOR AND MICROCONTROLLER**

Code: P22PYE2A

(Theory)

Credit: 4

**COURSE OBJECTIVES:**

To learn the architecture and programming and applications of Intel 8085.

To know the various peripheral devices and interfacing applications.

To understand the architecture and programming, and applications of Intel 8051.

**UNIT-I MICROPROCESSOR ARCHITECTURE AND INTERFACING:**

Intel 8085 microprocessor architecture – Pin configuration – Instruction cycle – Timing diagram – Instruction and data formats – Addressing modes – Memory mapping and I/O mapping I/O scheme - Memory mapping I/O interfacing - Data transfer schemes - Synchronous and asynchronous data transfer – Interrupt driven data transfer - Interrupts of Intel 8085.

**UNIT-II ASSEMBLY LANGUAGE PROGRAMS(8085 ONLY):**

BCD arithmetic - Addition and subtraction of two 8-bit and 16-bit numbers - Largest and smallest numbers in a data set – Ascending order and descending order – Sum of a series of 8-bit numbers – Sum of a series of multi-byte decimal numbers – Square root of a number – Block movement of data - Time Delay – Square-wave generator.

**UNIT-III PERIPHERAL DEVICES AND MICROPROCESSOR APPLICATIONS:**

Generation control signals for memory and I/O devices - I/O ports - Programmable peripheral interface - Architecture of 8255A - Control Word - Programmable interrupt controller (8259) - Programmable counter - Intel 8253 - Architecture, control word and operation – Block diagram and interfacing of analog to digital converter (ADC 0800) – Digital to analog converter (DAC 0800) – Stepper motor – Traffic Control.

**UNIT-IV MICROCONTROLLER 8051:**

Features of 8051 – Architecture – Pin configuration – Memory organization -- External data and program memory - Counters and timers – Serial data Input/output - Interrupt structure – External interrupts – Addressing modes - Comparison between microprocessor and microcontroller.

  
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## **UNIT-V 8051 INSTRUCTION SET AND PROGRAMMING:**

**Instruction Set–Datatransfer,arithmetic and logical instructions–Boolean Variable manipulation instructions – Program and machine control instructions –Simple programs – Addition and subtraction of two 8-bit and 16-bit numbers –Division–Multiplication-Largestnumberinaset–Sumofasetofnumbers.**

## **UNIT–VI CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**Discussionanddemonstrationofwaterlevelindicator–Securityalarm–EVM-Microprocessorsystemdesign–FPGAs–Embeddedsystems-RaspberryPi.**

## **COURSE OUTCOMES:**

**On The Successful Completion Of The Course,students will be able to**

- 1. AppreciatetheuseofmicroprocessorsandmicrocontrollersinthebasicsofModerncomputation.**
- 2.Familiarwiththebasicconceptsofassemblylanguageprogrammingof8085microprocessorandmicrocontroller.**
- 3. DesigncircuitsforvariousmathematicaloperationsusingOp-Amps.**
- 4. Applythemnemonicsof8085towritemicroprocessorprograms.**
- 5. ExplaintheworkinganddesignofvariousA/D'and D/Aconvertors.**

  
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Year: I

Semester: II

SubjectCode:P22PYE2A

ELECTIVE COURSE


**MICROPROCESSOR AND  
MICROCONTROLLER  
MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate  
(Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	2	3	2	2	2
CO2	3	3	2	3	2	2	2
CO3	2	-	-	-	-	-	-
CO4	3	3	3	3	2	2	2
CO5	3	3	3	2	2	2	2
optimal point	3	2	2	2	2	2	2

  
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Second Year

CORE COURSE VI

Semester III

**SOLID STATE PHYSICS**

Code: P22PYCC32

(Theory)

Credit: 5

**COURSE OBJECTIVES:**

To give exposure to structural properties of crystals and the X-ray diffraction principle.

To enhance understanding of the properties of conductors and semiconductors.

To build a strong foundation for the materials' lattice dynamics and thermal, dielectric and electrical properties of materials.

**UNIT-I CRYSTAL STRUCTURE:**

Crystal symmetry – symmetry elements – symmetry operations – Bravais lattices – Miller indices – X-ray diffraction – Bragg's law – Experimental methods of X-ray diffraction: Rotating crystal method and Debye – Scherrer powder method. Scattered wave amplitude: Fourier analysis – reciprocal lattice vector – Diffraction condition – Laue equations – Brillouin zones – reciprocal lattices to SC and BCC lattices – structure factor of BCC lattice – Atomic form factor.

**UNIT-II CONDUCTORS AND SEMICONDUCTORS:**

Conductors: Free electron theory – Classical and Quantum theory – Band theory of solids – Density of States – K-space – Bloch theorem – Kronig-Penney Model – Electrical conductivity and Ohm's law: Experimental electrical resistivity of metals – Umklapp Scattering. Semiconductors: Intrinsic and Extrinsic semiconductors – Band gap – Effective Mass – Carrier Concentration – Electrical Conductivity – Wiedmann-Franz law – Hall effect – Determination of type of conductivity – Carrier Concentration – Mobility – Resistivity.

**UNIT-III MAGNETIC AND DIELECTRIC PROPERTIES:**

Langevin's classical theory of diamagnetism and paramagnetism – Quantum theory of paramagnetism – Weiss Theory of Ferromagnetism – Origin of Domains – Hysteresis

– Domain theory – Curie temperature and Neel temperature. Dielectrics – Macroscopic electric field – Local electric field – Clausius-Mossotti relation – Dielectric Constant Polarizability – Types of Polarization – Determination of dielectric constant – Parallel Plate Method.

  
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#### **UNIT-IV SUPERCONDUCTIVITY:**

**Zeroresistance–Behaviourinmagneticfield–Meissner effect – Heat capacity –Energy gap – Microwave and infrared properties – Isotopic effect –Type I and Type II superconductors–Entropy–Thermal Conductivity–Thermodynamics Of Superconducting transmission - London equations– Coherence Length–BCS theory –Penetration Depth–JosephsonEffect–AC and DC – Quantum tunneling –High  $T_c$  superconductors.**

#### **UNIT-V OPTICAL PROPERTIES AND NEW MATERIALS:**

**Photoconductivity–Simplemodelofphotoconductor–Traps–Influenceoftraps– Luminescenceanditstypes–Photoluminescence–Cathodoluminescence–**

**ChemiluminescenceandThermo-luminescenceandglow curve.Shape Memory alloys**

**–Types–Structure–Temperatureinducedtransformation–Stressinducedtransformation– Functionalproperties–Shapememoryeffect–Superelasticity.**

#### **UNITVI CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**Applicationsofsuperconductors–SQUID-**

**Maglev.Electrontransportinsemiconductorsandnanostructures–Semiconductorquantumwells– Molecularmaterials–Nonlinearoptics.**

#### **COURSE OUTCOMES:**

**On The Successful Completion Of The Course,students willbeableto**

- 1.Applytheknowledgeofcrystalstructuretovarioustypesofcrystallinesolids,electricalandmagnetic materials.**
- 2. Differentiatevarioussolidmaterialsbasedontheirpropertiesandthelearnttheories.**
- 3. Analysethemagneticdielectricandopticalpropertiesofmaterials.**
- 4. Understand The Peculiar properties of superconducting materials.**
- 5. Know new materials and their practical applications.**

  
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## SOLID STATE PHYSICS MAPPING

### CO - PO – matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “- “

### CORECOURSEVI

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	-	1	1	2
CO2	3	2	3	3	1	-	1
CO3	2	1	3	1	3	-	-
CO4	3	1	2	3	3	1	1
CO5	3	2	2	1	2	1	1
optimal point	3	2	2	2	2	1	1

  
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Second Year

CORE CHOICE COURSE III

Semester III

ADVANCED QUANTUM MECHANICS

Code: P22PYCC3A

(Theory)

Credit: 5

COURSE OBJECTIVES

To get acquainted with approximation methods for time-independent and time-dependent Hamiltonians. To provide a sound knowledge of atomic and molecular structure through quantum formalism. To give a basic understanding of the theory of relativistic quantum mechanics.

UNIT-I TIME INDEPENDENT PERTURBATION THEORY:

Stationary theory – Non-degenerate case: First and Second order corrections – Normal Helium atom – Degenerate case: Energy correction – Stark effect in Hydrogen atom and Hydrogen molecule – Zeeman effect without electron spin.

UNIT-II TIME DEPENDENT PERTURBATION THEORY:

Constant perturbation – Transition probability - Fermi Golden Rule – Harmonic perturbation – Adiabatic and sudden approximation. Semiclassical theory of Radiation: Application of the Time dependent perturbation theory to semiclassical theory of radiation.

UNIT-III VARIATION METHOD: Variation principle – Upper bound states – Ground state of Helium atom – Hydrogen Molecule – WKB Approximation – Schrödinger equation – Asymptotic solution – Validity of WKB Approximation – Solution near a turning point – Connection formula for perturbation barrier.

UNIT-IV RELATIVISTIC QUANTUM MECHANICS:

Klein-Gordon equation – Charge and current densities – Interaction with electromagnetic field – Hydrogen like atom – non relativistic limit – Dirac relativistic equation: Dirac relativistic Hamiltonian – Probability density – Dirac matrices – Plane wave solution – Eigenspectrum – Spin of Dirac particle – Significance of negative eigenstate – electron in a magnetic field – Spin magnetic moment.

UNIT-V MANY ELECTRON SYSTEMS:

The Hartree-Fock self-consistent field method – Electron correlation – The atomic Hamiltonian – The Condon-Shortley rules – The Born-Oppenheimer Approximation – The Hydrogen molecule ion – Approximate treatment of  $H_2^+$  ground state – Molecular orbital theory – The Hydrogen molecule ion –  $H_2^+$ .

  
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**UNIT-VI CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**LagrangianandHamiltonian formulation of classical fields – Quantization of fields – Quantization of the Schrödinger equation – Klein Gordan and Dirac field –Quantization Of Electromagnetic Fields.**

**COURSE OUTCOMES:**

**Onthesuccessfulcompletion Ofthe Course,students willbeableto**

- **1. Understand Three Approximation Methods.**
- **2. Computethecorrectioninenergyusingtheapproximationtechnique.**
- **3. Applytheapproximationmethodtothestationarystateproblem.**
- **4. Appreciate The Relativistic Effect In Quantum Mechanics.**
- **5. Acquirebasicknowledgeofatomicandmolecularstructures.**

**Year: II**

**Semester: III**

**Subject Code:P22PYCC3A**

**CORECHOICECOURSEIII**

**ADVANCED QUANTUM**


**MECHANICS**

**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate  
(Medium) 3: Substantial (High)  
If there is no correlation, put “-“**

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>2</b>	<b>-</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>-</b>
<b>CO4</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>2</b>
<b>CO5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>
<b>optimal point</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>

  
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## PHYSICS OF NANOMATERIALS

Code:P22PYE3A

(Theory)

Credit:4

## COURSE OBJECTIVES:

- To provide an introduction to nanomaterials and their peculiar properties.
- To describe various techniques for the preparation of nanomaterials.
- To introduce various applications and characterization techniques.

## UNIT-I INTRODUCTION TO NANOTECHNOLOGY:

Emergence of nanotechnology – Nanomaterials –  
 Classification of nanomaterials based on composition, number of dimensions in nanoscale and morphology –  
 Characteristics of nanomaterials – Surface area to volume ratio – Its effect on properties of nanomaterials –  
 Nanoparticles – Nanoclusters – Nanocomposites – Nanohybrids.

## UNIT-II QUANTUM DOTS AND CARBON NANOTUBES:

Quantum dots (QDs) – Excitons confinement in quantum dots – Production and applications of QDs –  
 Quantum wires – Quantum wells – Carbon allotropes – Discovery of C<sub>60</sub> – Fullerenes – Types of fullerenes –  
 Bucky balls – Carbon nanotubes (CNTs) – Single walled CNTs – Multi-walled CNTs – Properties of  
 CNTs – Synthesis of CNTs – Plasma-arc discharge method – Laser ablation technique –  
 Chemical vapour deposition method – CNT emitters – Potential applications of CNTs.

## UNIT-III PREPARATION OF NANOMATERIALS:

Nanomaterials preparation: Top-down method – Working principles, merits and demerits of Ball milling –  
 Photolithography – Electron beam lithography – Molecular beam epitaxy – Bottom-up technique – Soft-  
 chemical method – Sol-gel synthesis – Electrochemical deposition – Atomic layer deposition – Langmuir  
 - Blodgett film (2D nanostructure) preparation – Green synthesis.

## UNIT-IV ANALYTICAL TECHNIQUES FOR NANOMATERIALS CHARACTERIZATION

Structural characterization: Principle of X-ray powder diffraction –  
 Determination of structural parameters – Optical studies: UV-Vis-NIR spectrometry –  
 Band gap determination by Tauc's plot method – Surface morphological analysis:  
 Scanning electron microscopy (SEM) – Scanning tunnelling microscope (STM) –  
 Transmission Electron Microscope (TEM) – X-ray photoelectron spectroscopy (XPS).

## **UNIT-V APPLICATIONS OF NANOMATERIALS:**

**Nanoelectronics – Molecular diodes and transistors – Quantum electronic devices –Nanophotonics– Photonic Crystals–Nanoelectromechanical Systems(NEMS)–Nanomaterials in energy conversion and storage – Nanomaterials as antibacterial agents –Nanomaterials as photo catalysts – Energy efficient windows – Nanomaterial Industrial Applications–Bio-medical applications:Targeted Drug Delivery.**

## **UNIT-VI CURRENT CONTOURS(Forcontinuousinternalassessmentonly):**

**Potential applications of nanomaterials: CNTs Air and Water Filtration - ConductivePlastics– Conductiveadhesives-CNTceramicmaterials–Nanoporousfilters- Electrontransportinsemiconductorsandnanostructures–Nanostructuredevices.**

## **COURSE OUTCOMES:**

**On The Successful Completion Of The Course,students will beableto**

- 1. ExplainhowtheNano-sized materials differ from bulk materials.**
- 2. Classify the synthesizing techniques suitable for different Nano-structuredmaterials.**
- 3. Makeuseoftheavailableinstrumentstostudythepropertiesofnanomaterials.**
- 4. Assess theeffectofgrain sizesonvariouspropertiesofnanomaterials.**
- 5. Interpret The Results of physical and chemical properties measurements.**



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Subject Code:P22PYE3A

**ELECTIVE COURSE III**

**PHYSICS OF NANO MATERIALS**

**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate  
(Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO5</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>optimal point</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>

  
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Second Year

CORE COURSE VII

CRYSTAL GROWTH AND THIN FILM PHYSICS

Semester IV

Code: P22PYCC41

(Theory)

Credit: 5

**COURSE OBJECTIVES:**

To introduce the knowledge of crystal growth and its characterization.

To Understand The Basic Ideas Of Thin Film Fabrication.

To impart knowledge about working principles of various analytical techniques.

**UNIT-I NUCLEATION THEORIES:** Importance of crystal growth – Classification of crystal growth methods – Nucleation Theory – Kinds of nucleation – Homogeneous nucleation – Heterogeneous nucleation – Secondary nucleation – Classical theory of nucleation: Gibbs Thomson equations for vapour and solution – Kinetic theory of nucleation – Becker and Doring concept on nucleation rate – Energy of formation of a spherical nucleus –

Statistical theory on nucleation: Equilibrium concentration of critical nuclei, Free energy of formation. **UNIT-II**

**CRYSTAL GROWTH TECHNIQUES:** Growth from low temperature solution: Selection of solvent and solubility – Meir's solubility diagram – Saturation and supersaturation – Metastable zone width – Meir's solubility diagram – Saturation and supersaturation – Metastable zone width – Growth by restricted evaporation of solvent, slow cooling of solution and temperature gradient methods – **Gel Growth Technique:** Principle – Various types – Structure of gel – Importance of gel – Experimental procedure – Chemical reaction method – Single and double diffusion method. **Melt Growth Techniques:** Bridgman technique – Czochralski technique – Verneuil method – Merits and demerits.

**UNIT-III FUNDAMENTALS AND APPLICATIONS OF THIN FILMS:**

Introduction – Advantages of thin film devices over their bulk counterparts – Thin film growth stages: Nucleation stage – Island stage – Coalescence stage – Channel, hole and continuous film stage – Properties of thin films: Sheet resistance – Porosity – Surface roughness – Adhesion – Application of thin films: Thin films in photovoltaic technologies dyesensitised solar cells – Thin films in electronic devices – Thin films in disinfectant technologies – Optical coatings – Chemical and mechanical applications.

**UNIT-IV PHYSICAL DEPOSITION AND CHEMICAL DEPOSITION METHODS:**

Basic of vacuum – Physical Vapour Deposition (PVD) – Thermal evaporation – Electron beam evaporation – Pulsed Laser Ablation – Molecular Beam Epitaxy – Sputtering techniques – DC and RF sputtering – Ion plating – Chemical methods – Electrodeposition and electroless plating – Chemical bath deposition – Spray pyrolysis – Spin coating – Dip coating – SILAR – Electrospinning – Hydrothermal – Sol-gel synthesis – Metalorganic (Chemical vapour deposition).



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## **UNIT-V CHARACTERISATION TECHNIQUES:**

**X-Ray Diffraction (XRD) – Powder and single crystal – Fourier transform Infrared – Raman analysis (FT-IR) – UV-Visible spectrometer – Photoluminescence - Vickers Microhardness- Chemical Etching- Surface Profilometry -Energy dispersive analysis of X-ray (EDAX) – Atomic force microscopy (AFM) – Thermo Analysis (TGA) – Differential Thermal Analysis (DTA).**

## **UNIT-VI CURRENT CONTOURS (For continuous internal assessment only):**

**Demonstration of solution growth in instruments and solubility measurements - Demonstration of vertical Bridgmann growth and Czochralski growth process and ampoule designing for Bridgmann growth - Demonstration of characterisation techniques.**

## **COURSE OUTCOME:**

**On the successful completion of the course, students will be able to**

- 1. Understand the various techniques of crystal growth.**
- 2. Acquire knowledge in the fields of thin films.**
- 3. Gain the knowledge of thin film preparation processes through physical and chemical methods.**
- 4. Know the working principles of characterization techniques.**
- 5. Comprehend the properties and applications of thin films.**

  
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# CRYSTAL GROWTH AND THIN FILM PHYSICS

Year: II

MAPPING

Semester: IV

Subject Code:P22PYCC41

CO - PO – matrices of course

ELECTIVE COURSE III

1:Slight (Low) 2: Moderate (Medium) 3:

Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	2	2	2	3	2
CO2	3	2	2	3	3	2	2
CO3	3	3	2	2	3	2	3
CO4	3	3	2	3	2	3	3
CO5	2	2	3	2	3	3	2
optimal point	3	2	2	2	3	3	2

  
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**NUCLEAR AND PARTICLE PHYSICS**

Code:P22PYCC42

**COURSE OBJECTIVES:**

To provide fundamental features of analytical instrumentation to the students.

To impart knowledge about the fundamental properties of the instrumental analysis and experiment and the theoretical aspects of the characterization techniques.

To know the basic theory of characterization techniques and application.

**UNIT – I TWO BODY PROBLEM AND NUCLEAR FORCES:**

Ground state of the Deuteron - Wave equation for the deuteron and its solution. Excited states of the deuteron, Normalization of the deuteron wave Function, Low energy Neutron – Proton Scattering, Scattering length. Spin dependence of n-p Interaction, Effective range theory. Non-Central Force - Quadrupole moment of the deuteron, Magnetic moment of the deuteron. Neutron-Neutron scattering, Exchange interaction and saturation of the nuclear force.

**UNIT – II NUCLEAR MODELS:**

Constitution of the nucleus- Fermi gas model of the nucleus. Nuclear shell structure-single particle states in nuclei- Spin-orbit interaction. Applications of extreme single particle shell model. Single particle shell model - Individual particle model-Collective model. Liquid drop model-Bohr-Wheeler Theory.

**UNIT – III RADIOACTIVITY:**

Alpha-decay and barrier penetration- Gamow's theory of alpha decay. Beta decay- Pauli's hypothesis- Fermi's theory of  $\beta$ -decay-Selection rules-Parity in  $\beta$ -decay- Helicity of Neutrino-Electron capture. Gamma-rays-Interaction of  $\gamma$  rays with matter-Photo-electric absorption-Electron-Positron pair production-Multipole radiations - Selection rules-Conservation of parity-Internal conversion.

**UNIT – IV NUCLEAR REACTION:**

Types of nuclear reactions- Conservation laws-Nuclear reaction kinematics. Nuclear cross section- Classical analysis of cross-section. Partial wave analysis of reaction cross-section. Inverse reaction- Principle of detailed balance (Reciprocity theorem). Compound nucleus- Disintegration of a Compound nucleus. Resonance cross-sections: Breit-Wigner dispersion formula. Direct reactions-Plane wave Born Approximation Theory of direct interactions. Nuclear Shock waves. Nuclear Reactors- Production reactors, Power reactors-Peaceful Nuclear Explosions- Nuclear Power production in India.



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## UNIT – V ELEMENTARY PARTICLES:

Classification of elementary particles-Conservation laws-CPT Theorem. Graviton, Photon, Gluon. Muons -Production-Nature of muon decay-muon interaction- muonium. Resonance particles, Symmetry classification of elementary particles-


SU(2) Symmetry-SU(3) Symmetry-Gell-Mann-Okubo mass formula for SU(3) multiplets. Quark hypothesis-Quark structures of mesons and baryons. Quantum Chromodynamics. Charmed quark-Beauty and Truth. Higgs Bosons.

## UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):

Neutrinos- Sources of neutrinos – Types of neutrino-Deduction of neutrino- Neutrino Oscillations in matter-Neutrino communication. Scintillation detectors – Positron Emission Tomography – X-ray Computed Tomography – Magnetic Resonance Imaging – Neutrino Telescopes.

### COURSE OUTCOME:

1. To understand Various aspect of nucleus properties.
- 2 Learn about the process of Radioactive Decays.
3. Learn the basic aspects of nuclear reaction.
- 4.To study the Fission and Fusion Reactors.
- 5.To Learn about Particle Physics.

  
The Head  
Dept. Of Physics & I.T.  
Bharathidasan Institute of Technology  
Trichy - 620 022.


## MAPPING

CO - PO – matrices of course

1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	3	2	2	2	3	2
CO2	2	3	2	3	3	2	2
CO3	3	2	2	1	3	3	3
CO4	3	2	3	2	2	2	2
CO5	3	2	1	2	3	2	-
optimal point	3	2	2	2	3	2	2

  
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Dept. Of Physics & I.E.  
Bhramati Sarda Gandhi College  
Tiruchirappalli - 620 002.

Second Year

Analytical Characterization Techniques

Semester IV

Code:P22PY1BC

(Theory)

Credit: 5

#### **UNIT - I STRUCTURAL CHARACTERIZATION**

**Principle of X-ray spectrometer technique – Small angle X-ray scattering – X-ray photoelectron spectroscopy – Auger relation of core hole – Application, strength and limitations of X-ray photoelectron spectroscopy**

#### **UNIT – II SPECTRAL CHARACTERIZATION:**

**Laser sources – Laser Raman Spectrometer – Radiation sources – Fourier Transform Interferometer – NMR basic principles – NMR spectrometer – ESR basic principles – Instrumentation of ESR**

#### **UNIT – III OPTICAL CHARACTERIZATION:**


**Instruments for absorption photometry – Photoluminescence principles – Instrumentation and Application – Ultraviolet absorption spectroscopy – Principle behind IR spectroscopy – Fourier Transform Infrared spectroscopy (FTIR) – Strength of FTIR spectroscopy**

#### **UNIT – IV THERMAL AND MECHANICAL CHARACTERIZATION:**

**Thermal methods – Thermogravimetric analysis – Differential Thermal analysis – Mechanical principles: Static and Dynamic measurement – Instrumentation of Extensometer analysis – Bending properties of materials – In-Plane Impact testing**

#### **UNIT – V MORPHOLOGICAL CHARACTERIZATION:**

**Basic principles – Instrumentations: Scanning Electron Microscopy (SEM) – Operation modes – Transmission Electron Microscopy (TEM) – Scanning Tunneling Microscopy (STM)**

  
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Bhrammali Swarna Gandhi College  
Tiruchirappalli - 620 002.

**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

**Basic principles – Instrumentations: X-ray photoelectron spectroscopy (XPS) – Ultraviolet photoelectron spectroscopy (UPS) –Brunauer Emmet Teller (BET) theory.**

**Hall effect measurement system – Analytical scanning electron microscope – In- site electrical characterization – Neutron scattering.**

**COURSE OUTCOME:**

- 1.To Gain Knowledge in Structural Characterization.**
- 2.To Study about Spectral Characterization.**
- 3.To understand about optical Characterization.**
- 4.To Know about Thermal Characterization.**
- 5.To Study about Morphological Characterization**

  
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**Dept Of Physics & I.E.**  
**Shri Muli Sadina Gandhi College**  
**Tiruchirappalli - 620 002.**

Second Year

Analytical Characterization Techniques

Semester IV

Code:P22PY1BC

(Theory)

Credit: 5

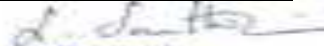
**MAPPING**

**CO - PO – matrices of course**

**1:Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	1	2	2	2
CO2	3	3	2	1	3	-	3
CO3	2	2	2	2	-	2	3
CO4	3	1	2	2	2	2	2
CO5	3	-	1	2	1	3	3
optimal point	3	2	2	2	2	2	3

  
The Head  
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Bhamburda Seelka Gandhi College  
Tumkur-572 002.



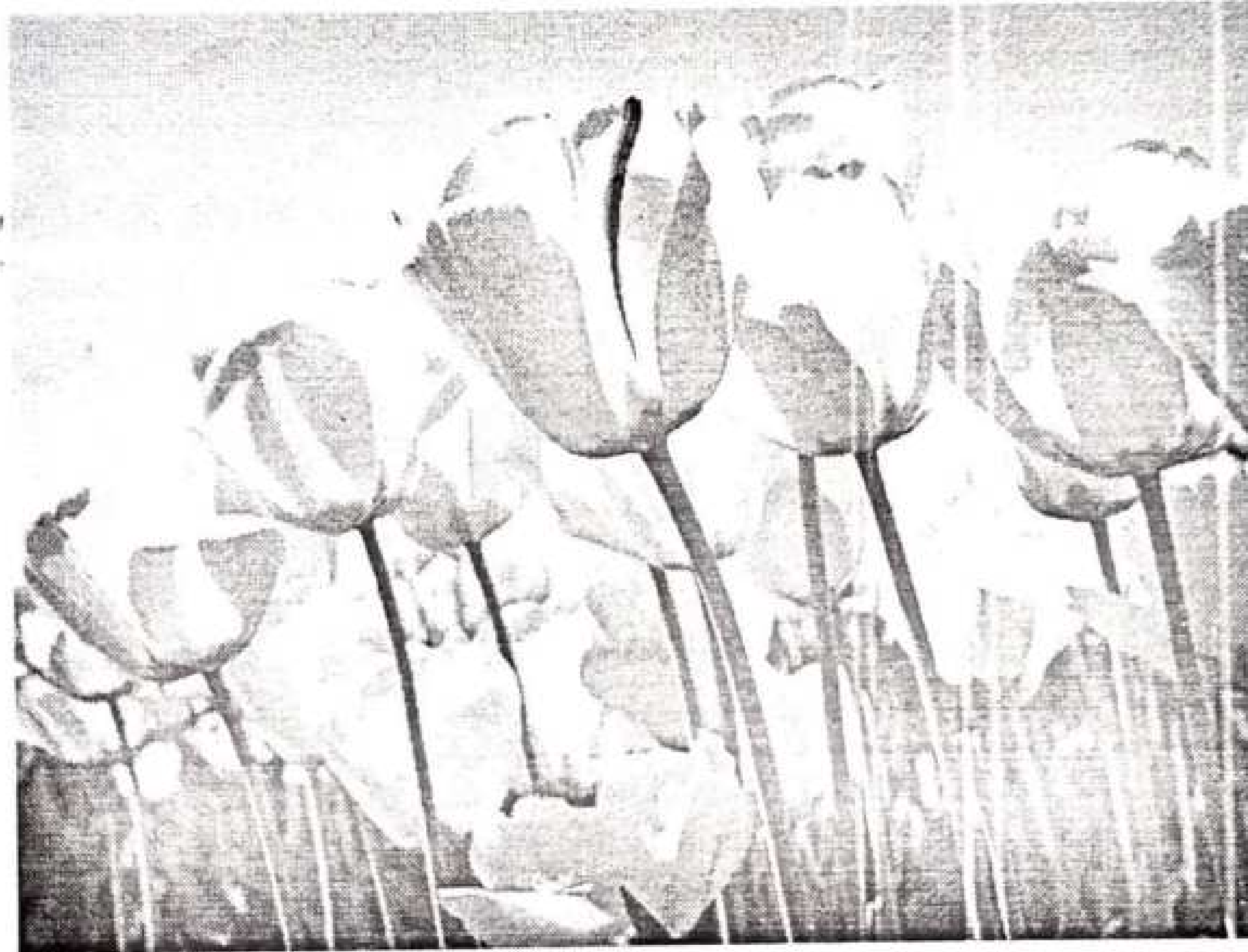


# **SHRIMATI INDIRA GANDHI COLLEGE**

(NATIONALLY ACCREDITED AT "A" GRADE (3 RD CYCLE) BY NAAC)

**TIRUCHIRAPPALLI-620002**

## **DEPARTMENT OF BANK MANAGEMENT**



**PROGRAMME AND COURSE OUTCOME, PSO**

## DEPARTMENT OF BANK MANAGEMENT

### Programme Specific Outcome

PSO 1	Prepare financial statements of business using accounting principles, concepts, conventions and provisions.
PSO 2	Develop skills to take up career opportunities ranging from roles in Finance and Accounting, Banking Industry, Corporate Sector etc. Some of the sectors which employ B. Com Bank Management degree holders are Banking, Media, BPOs, Tourism Industry, Hospitality, FMCG Telecom etc.
PSO3	Giving exposure to students regarding different aspects of setting up a new business
PSO4	Develop necessary professional knowledge and skills in finance and taxation
PSO5	Understanding legal issue/ law relating to banking and insurance sector

*K. Sujatha*

The Head

Dept Of B.Com Bank management  
Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002.

First Year

**CORE COURSE-I  
PRINCIPLES OF  
ACCOUNTANCY  
(Theory)  
2022-2023**

Semester-I

Code:22CCCBM1

Credit: 5

**PROGRAMME OUTCOMES**

- Become knowledgeable in the field of Commerce and apply the conceptual interpersonal managerial skills for decision making in a business enterprise
- Gain analytical skill in the areas of Accounting, Finance, Taxation and related Commerce courses.
- Understand and appreciate Professional Ethics, Community Living and Nation Building initiatives.
- Exhibit professional skills and knowledge for pursuing CA, CMA, ACS and other Career oriented programmes like ACCA, CFA, MBA and related PG Build competency to manage business and leadership challenges.

**UNIT-I INTRODUCTION OF ACCOUNTING AND CONCEPTS:**

Introduction–Accounting concepts and conventions–Accounting Standards–Meaning–Double entry system–Journal, Ledger, Subsidiary books, Trial Balance- Bank Reconciliation Statement.

**UNIT-II FINAL ACCOUNTS OF SOLE TRADERS:**

Final Accounts of sole traders with adjustment entries- Rectification of Errors.

**UNIT- III ACCOUNTS FOR NON-PROFIT ORGANISATION:**

Accounts of Non-profit organization–Bills of exchange–Average due date–Account Current.

**UNIT-IV CONSIGNMENTS AND JOINT VENTURES ACCOUNTS:**

Consignments and Joint Ventures.

**UNIT-V SINGLE ENTRY SYSTEM AND DEPRECIATION:**

Single Entry System. Depreciation-Methods, provisions and reserves.

(Theory 20% Problems 80%)

**UNIT- VI CURRENT CONTOURS (For continuous Internal Assessment Only):**

Contemporary Development related to the course during the Semester concerned

*K. Sujatha*  
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Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002.



**22CCCBM1- PRINCIPLES OF ACCOUNTANCY**  
**MAPPING**  
CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
 If there is no correlation, put “-”

**B.COM BANK MANAGEMENT**

PO-PSO- CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	-	3	3	2	3	3
CO2	3	3	3	3	2	3	3	3	2
CO3	3	2	3	3	3	3	3	3	2
CO4	3	3	3	3	2	3	3	3	3
CO5	3	-	2	3	3	2	3	-	2
Average	2.8	2.2	2.6	2.4	2.6	2.8	2.6	2.4	2.4

*K. Sujatha*  
 The Head

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 Tiruchirapalli - 620 002.

First Year: I

**CORE COURSE-II  
INDIAN FINANCIAL SYSTEM  
(Theory)**

Semester-I

Code:22CCCBM2

Credit: 5

**LEARNING OBJECTIVES:**

- To enable the students to know the meaning and significance of financial system.
- To make the students to know the organization and functions of RBI.
- To enable the students to know the functions of commercial banks.
- To develop knowledge about all India development banks.
- To know the objectives and functions of state level development banks.

**UNIT – I FINANCIAL SYSTEM:**

Meaning, significance and components – composition of Indian financial system. Indian money market – Indian capital market.

**UNIT – II RESERVE BANK OF INDIA:**

Organization, management and functions – credit creation and credit control; monetary policy.

**UNIT – III COMMERCIAL BANKS:**

Meaning, functions, management and investment policies of commercial banks – recent trends in Indian commercial banks.

**UNIT – IV ALL INDIA DEVELOPMENT BANKS:**

Meaning, concept, objectives and functions operational and promotional activities of all India Development Banks - UTI.

**UNIT – V STATE LEVEL DEVELOPMENT BANKS:**

Objectives, functions and role of State level banks; State financial corporations; development banks in industrial financing.

**UNIT VI CURRENT CONTOURS (For continuous Internal Assessment Only):**

Cooperative Banks

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Tiruchirapalli - 620 002.

**22CCCBM2 -INDIAN FINANCIAL SYSTEM  
MAPPING**

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

**B.COM BANK MANAGEMENT**

PO-PSO -CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	3	3	2	3	3
CO2	3	3	2	3	3	-	2	3	3
CO3	3	2	3	3	3	2	3	-	3
CO4	3	3	3	3	2	3	3	3	3
CO5	2	3	3	3	3	3	2	3	-
Average	2.8	2.6	2.8	2.8	2.8	2.2	2.4	2.4	2.4

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The Head

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Tiruchirappalli - 620 002



First Year

**FIRST ALLIED COURSE-I  
MANAGEMENT CONCEPTS  
(Theory)**

Semester-I

Code:22CFACEM1

Credit: 3

**OBJECTIVES:**

- To expose students to the history of management thought.
- To facilitate students, understanding of their own managerial skills for decision making,
- To examine the complexity of organization structure for business,
- To understand the importance of communication,
- To aware of controlling techniques used in organization.

**UNIT -I INTRODUCTION TO MANAGEMENT:**

Management- Definition- Nature, Scope, Functions and Levels of Management- Art, Science and Profession-Functions of Managers - Development of Management Thought- Contributions by F.W. Taylor, Henry Fayol and Others.

**UNIT- II ROLE OF PLANNING:**

Planning - Classification- Objectives- Characteristics- Steps- Process- Types- Methods- Advantages-Limitations, Decision Making- Policies.

**UNIT -III ORGANIZATION STRUCTURE:**

Organization and Structure- Types-Supervision and Span of Control- Departmentation- Organization Charts-Authority and Responsibility-Delegation and Decentralization.

**UNIT -IV MOTIVATION AND COMMUNICATION:**

Motivation- Types-Theories-Maslow, Herzberg, Mc Gregor and Others – Communication- Principles-Types and Barriers of Communication.

**UNIT -V LEADERSHIP:**

Leadership - Functions- Styles - Theories- Coordination- Features-Types and Techniques- Control -Process-Effective Control System-Techniques of Control.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Globalization- Development of Environment-Ethics and Social Responsibility- Multicultural Effectiveness- Challenges in Modern Leadership-Time Management-Increasing Team Spirit

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Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002.

## 22CCCBM2- MANAGERIAL CONCEPTS

### MAPPING

#### CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

#### **B.COM BANK MANAGEMENT**

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002.



First Year

**CORE COURSE-III**  
**BANKING THEORY LAW AND**  
**PRACTICE**  
(Theory)

Semester-II

Code:22CCCBM3

Credit: 5

**LEARNING OBJECTIVES**

- To acquire knowledge about relationship between banker and customer and services rendered
- To make the students understand the various types of accounts and savings schemes
- To give them an overview about types of customers
- To have clarity about the rights, responsibilities and duties of paying and collecting banker
- To make them aware of recent trends in Modern Banking,

**UNIT -I BANKER AND CUSTOMER:**

Definition of the term banker and customer – General relationship – special relationship – main functions and subsidiary services rendered by banker – agency services and general utility services.

**UNIT- II TYPES OF SAVING ACCOUNTS:**

Operations of Bank Accounts – Fixed Deposits – Fixed Deposit Receipt and its implications Savings Bank accounts – Current accounts – Recurring Deposit accounts- New Deposit savings schemes introduced by Banks – Super Savings Package – Cash Certificate, Annuity Deposit – Reinvestment plans – Perennial Premium plan – Non-Resident (External) accounts Scheme

**UNIT -III TYPES OF CUSTOMERS:**

Types of Customers – Account holders – Procedure for opening and closing of accounts of Customers- particulars of individuals including Minor, illiterate persons- Married women – Lunatics – Drunkards – Joint Stock Companies – Non- Trading Associations – Registered and Unregistered Clubs – Societies, Attorney - Executive and administration – Charitable institutions – trustees – Liquidators – Receivers – Local authorities – steps to be taken by banker in the event of death, Lunacy, Bankruptcy – winding up Garnishee Order.

**UNIT- IV PAYING AND COLLECTING BANKER:**

Paying and collecting bankers – rights, responsibilities and duties of paying and collecting banker – precautions to be taken in payment and collection of cheques – protection provided to them – nature of protection and conditions to get protection – payment in due course – recovery of money paid at mistake.

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The Head

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Tiruchirapalli - 620 002.

## UNIT -V PASS BOOK AND CHEQUES:

Pass book and Issue of duplicate pass book – cheques - Definition of a cheque – requisites of a cheque – drawing of a cheque - types of cheque – alteration – marking – crossing – different forms of crossing and their significance – Endorsement loss of cheques in transit – legal effect. Modern Banking, Banking practice – e banking – Internet banking – Mobile banking – ATMS- Cash Machine – EFT (Electronic Fund Transfer) – RTGs, NEFT, MICR.

## UNIT- VI CURRENT CONTOURS (For Continuous Internal Assessment):

Recent Trends, assignments and Seminars

## 22CCCBM3 – BANKING THEORY LAW AND PRACTICE

### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

*K. Sujatha*  
The Head

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Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002.



First Year

CORE COURSE-IV  
BUSINESS TOOLS FOR DECISION MAKING

Semester-II

Code:22CCCBM4

(Theory)

Credit: 5

**LEARNING OBJECTIVE:**

- To impart introduction to statistics, and Measure of central tendency
- To learn Measures of Dispersion and Skewness.
- To understand Simple correlation and regression
- To familiar with Time series and interpolation
- To study Index numbers.

**UNIT – I:**

Introduction – Meaning, Characteristics, Stages and Uses of Statistics – Classification and Tabulation – Diagrams and graphs – Bar and Pie diagrams – Graphs of one and two variables  
Graphs of frequency distribution - Measure of central tendency – Arithmetic mean, Median, Mode, Geometric Mean and Harmonic mean.

**UNIT – II:**

Measures of Dispersion – Range – Quartile deviation – Mean deviation – Standard deviation – Co-efficient of variation - Measurement of Skewness.

**UNIT – III:**

Correlation – Simple correlation – Karl Pearson's coefficient of correlation – Spearman's rank correlation – Concurrent deviation method - Regression analysis – Simple regression – Regression equations

**UNIT – IV:**

Analysis of Time series – Components – Methods – Semi average – Moving average - Method of least square – Interpolation – Meaning, Uses, Assumptions – Problems in Newton's method only.

**UNIT – V:**

Index numbers – Price index numbers – unweighted and weighted – Tests in index numbers (Problems in Time and factor reversal tests only) - Cost of living index number – Aggregate expenditure method – Family budget method.

**(Theory 20% Problems 80%)**

**UNIT –VI CURRENT CONTOURS (For Continuous Internal Assessment):**

Recent Trends, assignments and Seminars

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The Head

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Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002.

## 22CCCBM3 – BUSINESS TOOLS FOR DECISION MAKING

### MAPPING

#### CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

*K. Sujatha*  
The Head  
Dept Of B.Com Bank management  
Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002.

First Year

Code:22FACBM2

**FIRST ALLIED COURSE-II  
BUSINESS ECONOMICS  
(Theory)**

Semester-II

Credit: 3

**LEARNING OBJECTIVE:**

- To know about basics of Economics
- To understand the concept of demand and supply
- To know the factors of production and economics of large-scale production.
- To understand the concept of pricing under perfect and monopolistic competition.
- To learn fiscal policy of the Government.

**UNIT -I:**

**Introduction:** Definition, Nature and Scope of Economics– Art or Science – Concepts – Tools of Economic Analysis –Micro and Macro Economics – Decision making in Business – Meaning of Business Economics- The Economic System–Objectives of the Business Firm.

**UNIT -II:**

**Demand Analysis:** Types of Demand–Law of Demand– Demand curves - Utility Analysis of Demand–Elasticity of Demand and Demand Forecasting – Production function and law of returns: Factors of production–Law of variable proportions–The law of returns to scale–Economies of scale – Consumer's Equilibrium.

**UNIT -III:**

**Analysis of Supply:** Supply – Law of Supply - supply schedule and supply curve – Determinants of supply–Measurement of Elasticity of supply – Market Structure – Equilibrium of firm and industry – Optimum firm – Pricing under perfect & Monopolistic competition – Types of supply curves.

**UNIT -IV:**

**Competitions and Theories of Factors of Production:** Perfect Competition–Imperfect Competition–Theories of Rent, Wages, Interest and Population – National Income and Expenditure – Measurement – Fiscal policy method.

**UNIT -V:**

**Cost and Revenue:** Concepts of Cost –Cost of Production in short and long period–Demand and revenue curves–Relation between average and marginal revenue– Break Even Analysis.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment):**

Recent Trends, assignments and Seminars

*K. Infaltra*  
The Head

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Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002.



## 22CFACBM2 – BUSINESS ECONOMICS

### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

*K. Sujatha*

The Head

Dept Of B.Com Bank management  
Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002,

Second Year

Code:22CCCBM5

**CORE COURSE –V  
BUSINESS ACCOUNTING  
(Theory)**

Semester-III

Credit: 5

**LEARNING OBJECTIVES:**

- To help students gain knowledge about branch accounts and departmental accounts.
- To impart knowledge of handling hire purchase accounts and Installment purchase system.
- To transform knowledge about Self Balancing and Sectional Balancing ledgers and Royalty Account
- To enable students to prepare the accounts for Fire Insurance claims and sale of return.
- To impart skills for prepare the accounts for insolvency, statement of affairs.

**UNIT-I BRANCH AND DEPARTMENTAL ACCOUNTS:**

Branch accounts - (Excluding foreign branches) – Departmental accounts

**UNIT-II HIRE PURCHASE & INSTALLMENT PURCHASE SYSTEM:**

Hire Purchase accounts & Installment purchase system.

**UNIT-III ROYALTY ACCOUNTS:**

Self-Balancing and Sectional Balancing ledgers – Royalty Account.

**UNIT-IV FIRE INSURANCE CLAIMS AND ACCOUNT FOR SALE OF RETURN:**

Fire Insurance claims for loss of stock and profits – Accounting for sale or return.

**UNIT-V INSOLVENCY ACCOUNTS:**

Insolvency accounts – statement of affairs – insolvency of individual only.

**Theory 20% Problem: 80%**

**UNIT- VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Recent Trends, assignments and Seminars

*K. Sujatha*  
The Head

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Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002.

## 22CCCBM5 – BUSINESS ACCOUNTING

### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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The Head

Dept Of B.Com Bank management  
Shrimati Indira Gandhi College  
Tiruchirapalli - 620 002.



Second Year

Code: 22CCCBM6

CORE COURSE -VI  
CO - OPERATIVE BANKING  
(Theory)

Semester-III

Credit: 5

**LEARNING OBJECTIVES:**

- To enable the students to know the growth and structure of co-operative credit.
- To enable the students to know the functions of PACCS.
- To enhance the students to know about the working and functions of district and state co-operative banks.
- To develop knowledge about co-operative land development banks.
- To enable the students to know about the NABARD, SBI and commercial banks.

**UNIT - I:**

Growth of co- operative credit in India – structure of co-operative credit – prospects and problems.

**UNIT - II:**

Primary agricultural co-operative credit society (PACCS) – organization, functions and workings – lending policies and procedures – recovery and overdue problems – viability of primary co-operatives.

**UNIT - III:**

District co-operative banks – organization, functions and workings – lending policies and procedures, funds position – recovery and overdue problems. State co- operative banks – constitution and workings. Its role in institutional financing.

**UNIT - IV:**

Co-operative land development bank – SLDB – PLDB – constitution, workings – sources of funds, lending and overdue problems. Urban co-operative banks – employees co-operative credit societies – objects – functions and workings.

**UNIT - V:**

Role of NABARD and co-operative development - SBI and co-operatives – commercial banks and co-operative credit – marketing co-operative – structure – primary co-operative marketing societies – State co-operative marketing society – constitution – objectives – functions.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

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Dept Of B.Com Bank management  
Shrimati Indira Gandhi College  
Tiruchirappalli - 620 002,

## 22CCCBM6 – CO – OPERATIVE BANKING

### MAPPING

#### CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

#### **B.COM BANK MANAGEMENT**

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
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CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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The Head

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Srimati Indira Gandhi College  
Tiruchirapalli - 620 002.

## 22CSACBM1 – BUSINESS LAW

### MAPPING

#### CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

#### **B.COM BANK MANAGEMENT**

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Second Year

Code: 22CSACBM1

SECOND ALLIED COURSE –I  
BUSINESS LAW  
(Theory)

Semester-III

Credit: 3

## LEARNING OBJECTIVES

- To gain knowledge about the law relating to Business activities'
- To gain knowledge law relating to Contract
- To gain knowledge law relating to Bailment, lodgment and Agency
- To gain knowledge about the Law of sale of Goods Act
- To gain Knowledge about the Negotiable Instruments Act and Information Technology Act and to create awareness about e-commercial law (IT Act and Cyber - Crime)

### UNIT- I:

Mercantile Law: Introduction – Definition and Scope of Mercantile law – Sources of Mercantile Law – Contracts – Nature, Kinds and requisites for Valid contracts – Contingent Contract – Quasi Contract – Void agreements

### UNIT –II:

Contract: Performance of a Contract – Discharge of a contract - Remedies for breach including Specific Performance

### UNIT – III:

Agency: Indemnity and Guarantee – Bailment and pledge – Agency- Creation of Agency – Classification of Agents, Powers and Duties of Agent and Principal – Termination of Agency.

### UNIT – IV:

Law of sale of Goods: Definition- Essentials of a Contract of Sale – Goods – Classification of Goods - Distinction between Sale and Agreement to sell – Document of Title to Goods – Rules Regarding delivery of goods – Acceptance of delivery – Rights of an unpaid seller – condition & warranty.

### UNIT – V:

Law of Negotiable Instruments: Law of Negotiable Instruments (Instrument Amendment Act, 2015 – Definition – characteristics – classification- notes, bills, cheques and promissory note.) -

### UNIT VI CURRENT CONTOURS (For Continuous Internal Assessment Only)

Recent Laws relating to business: Cyber Laws- Information Technology Act 2000  
Recent Trends in Business Laws  
Recent amendments in Contract Act - Case studies

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Second Year

Code:22CCCBM7

**CORE COURSE -VII  
CREDIT MANAGEMENT  
(Theory)**

Semester-IV

Credit: 5

**OBJECTIVES:**

- To learn Forms of credit.
- To acquire knowledge about Principles of lending.
- To know the Benefits and dangers in using credit.
- To understand Credit Policy.
- The student will understand the Consumer Assessments.

**UNIT - I:**

Definition of Credit-concept of credit management-characteristics of credit- Forms of credit: Consumer credit, Commercial credit, Export credit, Banking credit, Agriculture credit.

**UNIT - II:**

Principles of lending – The 7C's of Credit – Fair practice code – Various types of Borrowers.

**UNIT - III:**

Benefits and dangers in using credit, understanding consumer rights and obligations.

**UNIT - IV:**

Credit Policy: Definition – Role and use of the policy – Basic contents of the policy.

**UNIT - V**

Consumer Assessments: Credit Bureau, Credit Applications, References, Credit evaluation of borrowers, Collection procedure, Debt Recovery Tribunal, Writing off Bad Debts.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment)**

Recent Trends self-study, assignments, Seminars Quiz and Self reading on Current developments related to the Credit management during the semester through collection, discussion and evaluation.

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## 22CCCBM7 – CREDIT MANAGEMENT

### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
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CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Second Year

CORE COURSE –VIII  
SERVICES MARKETING  
(Theory)

Semester-IV

Code:22CCCBM8

Credit: 5

**OBJECTIVES:**

- To enable the students to understand the word of Service Marketing.
- To understanding the Service product
- To enable the students to know the Service Location
- To enable the students to know the Service Process and Challenges for service managers
- To enable the students to learn the Role of Service Mix

**UNIT –I:**

Meaning and Definition of Service – Classification of Services – Services Marketing Triangle  
Significance of Services Marketing – Reasons for the Growth of the Services sector  
– The Service as a System.

**UNIT – II:**

Service product- Underlying Concepts – The Product Life-Cycle – New Service – Service Product Range – New Service Development (NSD) – New Service Product Features – Failure of new service Products – Achieving success in development of new service products – Service Product Elimination. Pricing for Services: Characteristics of Services and Prices – Price Terminologies – Understanding the costs of service incurred by customers – Understanding Value – Establishing monetary pricing objectives – Pricing relative to demand levels – Communicating Prices to the Target Markets – Additional Aspects of Service Pricing - Pricing strategy – Pricing and Marketing Strategy

**UNIT – III:**

Service Location- Flexibility – Classification by location – Accessibility through coproduction  
Service Channel Development – Methods of distributing Services – Innovations in Methods of Distributing Services –Inputs for location decisions – Basic Location Models. Promoting Services: – Promotional Objectives – Differences in Promoting Services – Selection Criteria – Developing the promotional mix – Guidelines for Improving the Promotion of Services – The role of sales promotion – Sales Promotion tools – Direct Marketing – Public Relations – The role of marketing communication – Target Audience – Branding services: Trends – Brand image development – Setting advertising objectives –Audience response – Guidelines for Service Advertising.

**UNIT – IV:**

Service Process- Introduction – Classification of Services Operating Systems – Policies and flowcharting – Balancing supply and demand – Change – Organizational Conflict in Service Systems – The Systems Concept in Services – Purchase Process – Process of vision – Facilitating process – Challenges for service managers – Breakthrough services – Process improvement – The Self – Reinforcing Service Cycle. Service Design –Design Methodology  
–The Service Design and management model – Overview of model stages – Blueprinting –

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Building a service blueprint – Benefits of service blueprinting – Service Mapping – Service Failures – Design elements – Quality function deployment.

#### UNIT – V:

Role of Service Mix – Health Care – Tourism – Hotel – Travel – Insurance – Banking – Public Utility Services – Educational Services.

#### UNIT -VI CURRENT CONTOURS: (For Continuous Internal Assessment only):

Quiz and Self reading on Current developments related to the Service Marketing during the semester through collection, discussion and evaluation. To be sourced from multiple reliable informative sources- Print, Internet, Interaction, Social Media, Webinars and so on.

### 22CCCBM8 – SERVICES MARKETING

#### MAPPING

##### CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

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CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Second Year

Code:22CSACBM2

**SECOND ALLIED COURSE -II  
BUSINESS COMMUNICATION  
(Theory)**

Semester-IV

Credit: 3

**LEARNING OBJECTIVE:**

- To know the basics of communication
- To understand various types of communication
- To know how to prepare various reports
- To prepare different types of letters
- To prepare different types of corporate communication

**UNIT -I COMMUNICATION IN BUSINESS:**

Meaning-Importance of communication – Forms of Communication - Nature-Scope-  
Network of the Communication – Process of Communication – Barriers to  
Communication.

**UNIT-II ENQUIRIES, ORDERS, CREDIT AND CLAIMS:**

Enquiries and Replies-Orders and their Execution- Credit and Status Enquiries-Claims and  
Adjustments.

**UNIT-III COLLECTION, SALES, CIRCULAR AND BANK  
CORRESPONDENCE:**

Collection letter – Sales letter –Circular letter-Letters to Government-Bank Correspondence-  
Import and Export Agency.

**UNIT-IV APPLICATION LETTERS:**

The form and contents of an application letter-Bio-data-Application blanks – Specimen  
application letters- Reports-By individuals-By Committees.

**UNIT-V MODERN COMMUNICATION METHODS:**

Online Communication-Fax-E-mail-Voicemail-SMS-Internet-Teleconferencing-  
Videoconferencing-Electronic bulletin boards.

**UNIT -VI CURRENT CONTOURS: (For Continuous Internal Assessment only):**

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## 22CSACBM2 – BUSINESS COMMUNICATION

### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

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CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

Code:22CCCBM9

CORE COURSE -IX  
CORPORATE ACCOUNTING  
(Theory)

Semester-V

Credit: 5

**LEARNING OBJECTIVES:**

- To enable the students to know about accounting procedure in corporate accounting
- To make learner to understand format of company final accounts and various schedules of company final accounts.
- To make learner to acquaint information of buy-back of shares and their legal formalities
- To acquaint learner with various methods and techniques of amalgamation
- To understand sources of financial activities towards company
- Develop among learners various skills of corporate techniques to be applied for minimization of cost and maximization of profit

**UNIT -I:**

Shares - introduction legal provisions regarding issue of shares, application, allotment, calls, calls-in-arrears, calls-in-advance, issue of shares at premium- issue of shares at discount- forfeiture of shares - re-issue-accounting entries.

**UNIT- II:**

Debentures -Issue and redemption of debentures - methods of redemption of debentures- installment - cum-interest and Ex-interest redemption by conversion, sinking fund, insurance policy. Redemption of preference shares- implication of Section 80 and 80A of the Companies Act

**UNIT -III:**

Amalgamation - purchase consideration- accounting treatment - pooling of interest method and purchase method, Absorption, external and internal reconstruction of companies.

**UNIT -IV:**

Accounts of Holding company - legal requirements relating to presentation of accounts -Consolidation of balance sheet (excluding chain holding)

**UNIT -V:**

Final accounts of banking companies (new format) and Insurance companies (New Format)

Theory: 20%, Problem: 80%

**UNIT -VI CURRENT CONTOURS: (For Continuous Internal Assessment only):**

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## 22CCCBM9 – CORPORATE ACCOUNTING

### MAPPING

CO – PO -PSO matrices of course

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### B.COM BANK MANAGEMENT

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CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

CORE COURSE -X

Semester-V

COMPUTER APPLICATION IN  
BUSINESS  
(Theory)

Code:22CCCBM10

Credit: 5

**LEARNING OBJECTIVES:**

- To enable the students to know the importance of computer application in business. and MS word
- To learn MS Excel
- To understand computerized accounting particularly Tally
- To familiar with accounting of inventories
- To know computerization of final account.

**UNIT – I:**

Computer – Meaning – Characteristics – Areas of application – Components – Memory control unit – Input and output devices – MS Word – Creating word documents – creating business letters using wizards – editing word documents – inserting objects – formatting documents – spelling and grammar check – word count – thesaurus, auto correct working with tables – opening, savings and closing documents – mail merge.

**UNIT – II:**

Spread sheet – Spread sheet programs and applications – MS Excel and features – Building work sheets – entering data in work sheets, editing and formatting work sheets – creating and formatting different types of charts - application of financial and statistical function – creating, analyzing and organizing data – opening and closing work books – Introduction to Pivot tables.

**UNIT – III:**

Fundamentals of Computerized accounting – Computerized accounting Vs manual accounting - Architecture and customization of Tally – Features of Tally – latest version – Configuration of Tally – Tally screens and menus – Creation of company – Creation of groups – Editing and deleting groups – Creation of ledgers – Editing and deleting ledgers – Introduction to vouchers – Vouchers entry – Payment vouchers – Receipt vouchers – Sales vouchers – Purchase vouchers – Contra vouchers – Journal vouchers – Editing and deleting vouchers.

**UNIT – IV:**

Introduction to Inventories – Creation of stock categories – Creation of Stock groups – Creation of Stock items- Configuration and features of stock item– Editing and deleting stocks – Usage of stocks in Vouchers entry. Purchase orders – Stock vouchers – Sales orders – Stock vouchers – Introduction to cost – creation of cost category – Creation cost centers – Editing and deleting cost centers & categories – Usage of cost category and cost – centers in vouchers entry – Budget and controls – Creation of budgets – Editing and deleting budgets – Generating and printing reports in detailed and condensed format.

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## UNIT - V:

Day books - Trial balance - Profit and Loss account - Balance sheet. Ratio analysis, Cash flow statement - Fund flow statement - Cost center report - Inventory report - Bank Reconciliation Statement.

## UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only)

MS Power Point - Creating a simple presentation - Creating, inserting and deleting slides - Saving a Presentation

## 22CCCBM10 - COMPUTER APPLICATION IN BUSINESS

### MAPPING

CO - PO - PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put "-"

### B.COM BANK MANAGEMENT

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CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

**CORE PRACTICAL-I  
COMPUTER APPLICATIONS IN  
BUSINESS  
(Practical)**

Semester-V

Code:22CCCBM1P

Credit: 5

**LEARNING OBJECTIVE:**

- To develop skill on preparation of business letters, bio-data, Table.
- To create work sheet, Charts, and enclosures.
- To filter date using Auto filter, and application of accounting and statistical formulae.
- To make voucher entries, Prepare final accounts from the trial balance and Inventory report
- To Prepare Bank Reconciliation Statement and pay roll and computation of GST.

**LIST OF PRACTICAL**

**UNIT- I - MS WORD PROCESSING:**

1. Creating business letters
2. Creating an application for the job with the bio-data
3. Creating Circular letter with mail-merge options
4. Creating a Table by using the split and merge options

**UNIT -II - MS-EXCEL – SPREAD SHEET APPLICATIONS:**

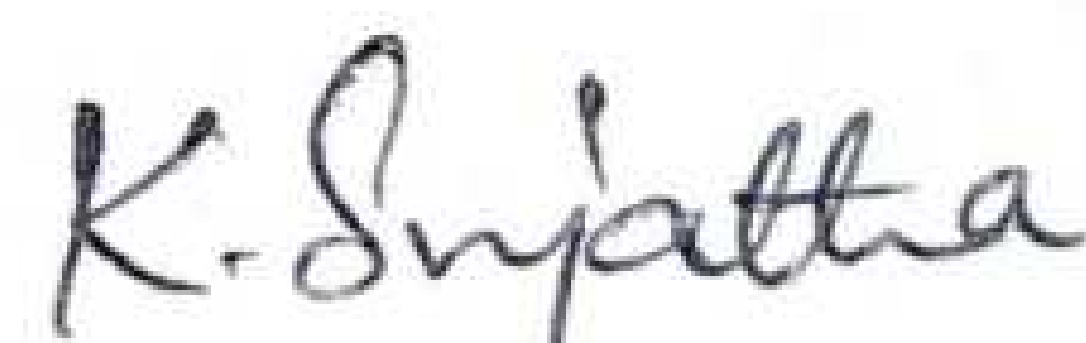
1. Creating a work sheet like mark sheet, Pay Slip, PF Contribution list etc.
2. Creating Charts – All types of charts and graphs
3. Creating a list for the enclosures

**UNIT -III - MS-EXCEL – SPREAD SHEET APPLICATIONS:**

1. Filtering the date using Auto filter custom filters using comparison operations
2. Creating Pivot tables
3. Commercial Formula applications
4. Statistical formula applications (within the syllabus of business tools for decisions)

**UNIT -IV - ACCOUNTING PACKAGE:**

1. Preparing voucher entries for the given transactions.
2. Preparing final accounts from the trial balance given with any ten adjustments
3. Inventory report

  
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## UNIT -V - ACCOUNTING PACKAGE:

1. Bank Reconciliation Statement
2. Preparation of pay roll vouchers based on attendance
3. GST computation & forms

## UNIT – VI CURRENT CONTOURS: (for Continuous Internal Assessment only)

MS Power Point - Creating a simple presentation – Creating, inserting and deleting slides – Saving a Presentation

(Practical – 100 marks UE: 60 marks IA: 40marks)

## 22CCCBM1P – COMPUTER APPLICATION IN BUSINESS

### MAPPING

#### CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

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CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

CORE COURSE – XI  
MANAGEMENT ACCOUNTING  
(Theory)

Semester-V

Code:22CCCBM11

Credit: 5

**OBJECTIVES:**

- To understand the concepts of Management Accounting.
- To gain knowledge on fund flow and cash flow in Business operation.
- To understand budget and budgetary control in Business organization.
- To know the technique of marginal costing and standard costing
- To know the various methods of capital budgeting.

**UNIT-I INTRODUCTION AND FINANCIAL STATEMENT ANALYSIS:**

Management accounting – Definition – Objectives – Nature – Scope – Merits and limitations – Differences between management accounting and financial accounting – Management Accounting Vs Cost accounting - Financial statement analysis – Comparative statement – Common size statement–Trend percentage–Ratio analysis.

**UNIT-II FUND FLOW AND CASH FLOW STATEMENT:**

Fund flow statement – Schedule of changes in working capital – Funds from operation – Sources and applications –Cash flow statement–Fund flow statement Vs Cash flow statement–Preparation of cash flow statement as per AS-3

**UNIT-III BUDGET AND BUDGETARY CONTROL:**

Budget and Budgetary control –Advantages- limitations – Types – Preparation of Purchase, Production, sales, Flexible, Cash and Master budget

**UNIT-IV MARGINAL AND STANDARD COSTING:**

Marginal costing – CVP analysis – Break even analysis – BEP – Managerial applications – Margin of safety – Profit planning. Standard Costing – Problems relating to Material and Labour variance only.

**UNIT-V CAPITAL BUDGETING**

Capital Budgeting – Payback period – Accounting rate of return –Discounted cash flow – Net present value – Profitability index – Internal rate of return.

**(Problem 80 %, Theory 20 %)**

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

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## 22CCCBM11 – MANAGEMENT ACCOUNTING

### MAPPING

#### CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

#### **B.COM BANK MANAGEMENT**

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CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

MAJOR BASED ELECTIVE COURSE-I  
1. ENTREPRENEURSHIP DEVELOPMENT  
(Theory)

Semester-V

Code:22CMBEBM1

Credit: 5

**OBJECTIVES:**

- To inculcate students to come up with good entrepreneur,
- To overcome the problems and challenges from the society,
- To know the role of small scale industries to obtain the next level of business,
- To improve the knowledge of process of business,
- To understand the passage of getting loan from project finance

**UNIT- I INTRODUCTION TO ENTREPRENEURSHIP:**

Entrepreneurship-Definition-Nature- Scope in Local and Global Market -Characteristics-Functions-Types- Entrepreneur and Intrapreneur-Women and Rural Entrepreneurs-The Revolutionary Impact of Entrepreneurship-Types of Enterprises and their Features-Manufacturing, Service and Trading-Steps in setting up of a Business.

**UNIT- II ENTREPRENEURIAL COMPETENCIES:**

Entrepreneurial Environment-Components-Role of Family and Society- Entrepreneurial Motivation- Barriers in Business -Training and Development – Entrepreneurial Change-Occupational Mobility-Factors in Mobility.

**UNIT -III INSTITUTION FOR THE DEVELOPMENT OF SMALL-SCALE INDUSTRIES:**

Entrepreneurship Development Programs (EDP)-Objectives- Importance-Phases- Evaluation-EDP Institutions in India-SSIB-SIDCO-SISIS-DICS-NSIC-SIDO-KVIC- NISEBUD-NISIET-Technical Consultancy Organizations-Functions

**UNIT -IV PROJECT MANAGEMENT:**

Project Management-Concept of Project-Classification-Sources of Business Ideas-Project Identification-Project Formulation and Design-Feasibility Analysis-Financial Analysis-Social Cost Benefit Analysis-Project Appraisal Methods -Project Report Preparation

**UNIT-V ENTREPRENEURIAL DEVELOPMENT AGENCIES:**

Project Finance-Sources of Finance-Institutional Finance-Role of IFC, IDBI, ICICI, LIC, SFC, SIPCOT-Commercial Banks-Appraisal of Bank for Loans- Entrepreneurship Incentives -Subsidies-Industrial Units- Benefits-Role of Industrial Estates

**UNIT -VI CURRENT CONTOURS: (For Continuous Internal Assessment Only)**

Geographical Challenges- Historical Attributes to Business-Country Topographical Features-New Business Formation- Current Market Trends-Decision Making Skills.

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## 22CMBEBM1 - ENTREPRENEURSHIP DEVELOPMENT

### MAPPING

#### CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

#### **B.COM BANK MANAGEMENT**

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Third Year

MAJOR BASED ELECTIVE COURSE-I  
2. MARKETING MANAGEMENT  
(Theory)

Semester-V

Code:22CMBEBM2

Credit: 5

**OBJECTIVES:**

- To understand the trends in, Marketing Management and to make aware of regulations of foreign trade practices in the era of globalization.
- To know the elements of Marketing Management
- To assess of buying behavior and consumer behavior.
- The student will understand the overview of Marketing Management
- To gain thorough knowledge on customer satisfaction

**UNIT -I INTRODUCTION TO MARKETING MANAGEMENT:**

Introduction to Marketing Management – nature and scope – Concepts of marketing – Functions and problems of marketing management – Traditional marketing – Modern Marketing – Responsibilities of marketing manager – Role of marketing management in Indian economy.

**UNIT -II CONSUMER BEHAVIOUR:**

Buyer behavior – Consumer behavior vs. business buying behavior – Factors affecting consumer behavior – Consumer research – Importance – Consumer research process – Consumer research design – Steps in consumer research.

**UNIT- III PROMOTION:**

Promotion – Tools of promotion – Communication process – Characteristics of promotion- Merits – Demerits – Designing a promotion campaign – Promotion – mix – Determinants – Promotion tools – Advertising – Sales promotion – Public relations.

**UNIT -IV MARKETING ORGANIZATION AND CONTROL:**

Marketing organization and control – Emerging trends and issues in marketing – Rural marketing – Social marketing – On – line marketing – Green marketing – network marketing.

**UNIT -V CUSTOMER SATISFACTION:**

Customer satisfaction – Difference between consumer and customer – Consumerism – Rights of consumers – Customer expectation – Changing perceptions of customer – Benchmarking – Total quality management.

**UNIT -VI CURRENT CONTOURS: (For Continuous Internal Assessment only):**

Quiz and Self reading on Current developments related to the Marketing management during the semester through collection, discussion and evaluation.

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## 22CMBEBM2 – MARKETING MANAGEMENT

### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

SKILL BASED ELECTIVE COURSE - I  
INFORMATION TECHNOLOGY  
CONCEPTS  
(Theory)

Semester-V

Code: 22CSBEBM1

Credit: 2

**LEARNING OBJECTIVES:**

- To introduce Evolution, Classification and Applications of Computers
- To know Computer peripherals
- To learn about Software, Programming Language, Word Processing and Spread Sheets Presentation
- To study Data Communication and BDP
- To aware utility of computers at different places, computer security and internet

**UNIT- I:**

Introduction to Computers - Definition, Characteristics of computer, Evolution of Computer, Block Diagram Of a computer, Generations of Computer, Classification of Computers, Applications of Computer, Capabilities and limitations of computer.

**UNIT -II:**

Computer peripherals - Role of I/O devices in a computer system. Input Units: Keyboard, Terminals and its types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, Output Units: Monitors and its types. Printers: Impact Printers and its types. Non-Impact Printers and its types, Plotters, types of plotters, Sound cards, Speakers, storage units.

**UNIT- III:**

Software and its needs, Types of S/W. System Software: Operating System, Utility Programs Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. Application S/W and its types: Word Processing, Spread Sheets Presentation, Graphics, DBMS s/w.

**UNIT- IV:**

Data Communication and BDP: Communication Process, Data Transmission speed, Communication Types (modes), Data Transmission Medias, Modem. Business Data Processing: Introduction, data storage hierarchy, Method of organizing data, File Types, File Organization.

**UNIT- V:**

Computers at Home, Education, Entertainment, Business, Science, Medicine and Engineering - Introduction to Computer Security - Computer Viruses, Bombs, Worms - WWW and Internet

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## UNIT – VI CURRENT CONTOURS (for Continuous Internal Assessment only)

Recent developments in computer world

### 22CSBEBM1 – INFORMATION TECHNOLOGY CONCEPTS

#### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

#### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

CORE COURSE-XII  
DIGITAL BANKING  
(Theory)

Semester-VI

Code:22CCCBM12

Credit: 5

**OBJECTIVES:**

- To learn e-banking and its features.
- To acquire knowledge about electronic delivery channels.
- To impart regulations of e-banking cards
- To understand digital banking cards
- To understand the genesis and concept of Online-Banking

**UNIT –I ELECTRONIC BANKING:**

E-Banking – Meaning - Benefits – Internet Banking Services –Drawbacks – Mobile Banking – Features – Drawbacks – Call Centre Banking – Features – Challenges –Traditional Vs e-banking - e-banking in India.

**UNIT- II DIGITAL CARDS:**

Introduction –concept and meaning-the electronic delivery channels- need for computerization- ATM – Types - Features – Benefits – Challenges – Credit Cards –Benefits – Constraints – Debit Card – Benefits– Smart Card – Features – Benefits of Smart cards - Biometric Cards – Features.

**UNIT –III MODERN BANKING OPERATIONS:**

National Electronic Fund Transfer (NEFT) - RBI Guidelines – Benefits of Electronic Clearing Systems – E- Cheques – E-Money – Real Time Gross Settlement (RTGS) – Benefits to Banker and Customer – Cheque Transaction – Core Banking Solutions (CBS) – Benefits – Single Window Concepts – Features- CIBIL (Credit Information Bureau (India)Ltd – MICR Cheques.

**UNIT –IV E-BANKING SECURITY:**

Introduction need for security –Security Concepts-Privacy – Survey. Findings on security Attack- Cyber-Crimes-Reasons for Privacy-Tampering- Encryption –Meaning-The encryption process-may appear as follows -Cryptogram- Cryptanalyst-cryptography-Types of Cipher systems –Code Systems-Cryptography-Cipher- Decipher-Jumbling-Asymmetric-Crypto system Data Encryption Standard (DES).

**UNIT- V E-BUILDER SOLUTIONS:**

Digital certificate-Digital Signature &Electronic Signature-E- Security solutions—solutions providers-E-locking technique-E-locking services-Netscape security solutions-Pry Zone -E software security Internet-Transactions-Transaction security-PKI-Sierras Internet solutions inc –security devices-Public Key Infrastructure- (PKI)-Firewalls Secure Ledger-(FSL)-Secure Electronic Transaction (SET).

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22CCCBM13 – INCOME TAX LAW AND PRACTICE  
MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

**B.COM BANK MANAGEMENT**

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

Code:22CCCBM13

**CORE COURSE-XIII**  
**INCOME TAX LAW AND PRACTICE**  
(Theory)

Semester-VI

Credit: 5

**LEARNING OBJECTIVES:**

- To understand the concept of Income tax
- To describe how to arrive taxable income from salary
- To find out the tax able income from house property
- To calculate the taxable income from Business and Profession.
- To ascertain the capital gains and income from other sources

**UNIT-I INCOME TAX ACT 1961 AND RESIDENTIAL STATUS:**

Income-Tax Act, 1961-Definitions- Basis of charge different types of assesses previously earned Assessment year – capital and revenue income, expenditure and loss– incomes exempted under section10 – Residential status.

**UNIT-II INCOME FROM SALARY:**

Income from salary: Basis of charge-Different forms of salary, allowances, perquisites and their valuation– computation of taxable salary-deductions from salary.

**UNIT-III INCOME FROM HOUSE PROPERTY:**

Income from House Property: Basis of charge– determination of annual value–GAV, NAV–income from let-out property–self occupied property–deductions–computation of taxable income.

**UNIT-IV INCOME FROM BUSINESS OR PROFESSION:**

Income from Business or Profession: Basis of charge –methods of accounting – deductions – disallowances, computation of taxable income –profit and gains of business and profession.

**UNIT -V INCOME FROM CAPITAL GAINS INCOME FROM CAPITAL GAINS:**

Basis of charge–short- and long-term capital gains–indexed cost of acquisition and improvement–exemptions–computation of taxable capital gains-Computation of Income from other sources

**Theory 20% Problem80%**

**UNIT- VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Recent Trends self-study, assignments and Seminars

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## UNIT -VI CURRENT CONTOURS: (For Continuous Internal Assessment only)

Quiz and Self reading on Current developments related to the Digital Banking during the semester through collection, discussion and evaluation. To be sourced from multiple reliable informative sources- Print, Internet, Interaction, Social Media, Webinars and so on.

### 22CCCBM12 – DIGITAL BANKING

#### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

#### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

Code:22CCCBM14

**CORE COURSE-XIV  
FINANCIAL SERVICES  
(Theory)**

Semester-VI

Credit: 5

**LEARNING OBJECTIVES:**

- To enable the students to know the meaning and types of financial services.
- To make the students to understand the meaning and features of hire purchase.
- To develop Knowledge about mutual funds.
- To Knowledge the students to know the meaning and features of venture capital.
- To enhance the students to know about the significance and types of Factoring.

**UNIT – I INTRODUCTION TO FINANCIAL SERVICES:**

Financial services – meaning – classification – financial products and services – challenges facing the financial service sector – merchant banking – meaning – functions – SEBI guidelines – scope of merchant banking in India. NBFCs – RBI guidelines.

**UNIT – II HIRE PURCHASE AND LEASING:**

Hire purchase – meaning – features – process – hire purchase and credit sales – hire purchase vs installment purchase – leasing – concept – steps involved in leasing – lease share purchase – types of lease – problems and prospects of leasing in India.

**UNIT – III MUTUAL FUNDS:**

Mutual funds – meaning – types – functions – advantages – institutions involved – UTI, LIC, commercial banks – entry of private sector – growth of mutual funds in India – SEBI guidelines – asset management companies.

**UNIT – IV VENTURE CAPITAL:**

Venture capital – meaning – features – methods of venture capital financing – models of venture financing – venture capital investment process – factors determining venture investment – advantages of venture capital – issues of Indian venture capital.

**UNIT – V FACTORY:**

Factoring - concepts – significance – types – factoring vs bills discounting – factoring in India – forfeiting – meaning – forfeiting Vs export factoring – Problems of forfeiting / factor in

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Recent Trends, assignments and Seminars

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## 22CCCBM14 – FINANCIAL SERVICES

### MAPPING

#### CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

#### **B.COM BANK MANAGEMENT**

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

MAJOR BASED ELECTIVE COURSE-II  
I. INVESTMENT BANKING  
(Theory)

Semester-VI

Code:22CMBEBM3

Credit: 5

**LEARNING OBJECTIVES:**

- To understand the Investment banking
- To educate Securities Market
- To learn Global Capital market
- To impart Corporate restructuring
- To learn Venture capital

**UNIT – I:**

Investment banking – Introduction – History and evolution of Universal banks and Financial conglomerates. Industry structure – Indian investment banks – asset management and securities business.

**UNIT – II**

Securities Market: Primary Market - Introduction – Equity Capital Market, Debt Capital Market and Derivatives segments. Primary market intermediaries. Role of Merchant bankers in the issue management of IPO and FPO. Underwriting.

**UNIT – III:**

Global Capital market – International listing – Equity Issues through Depository Route. Bond markets and Issues. Buy backs and De listings.

**UNIT – IV:**

Corporate restructuring – Internal and External restructuring – Types – Asset based restructuring – demerger, hive off, asset sale etc. Equity based restructuring – equity spin off, Disinvestment etc. Mergers and Acquisitions – methodologies.

**UNIT – V:**

Venture capital – methods. Leasing and Hire purchase business – methods. Mutual Funds management. Securitization of debts, Factoring and Forfaiting services.

**UNIT -VI CURRENT CONTOURS: (For Continuous Internal Assessment only) :**

Quiz and Self reading on Current developments related to the Investment Banking during the semester through collection, discussion and evaluation. To be sourced from

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multiple reliable informative sources- Print, Internet, Interaction, Social Media, Webinars and so on.

## 22CCCBM11 – INVESTMENT BANKING

### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

Code: 22CMBEBM4

MAJOR BASED ELECTIVE COURSE-II  
2. INTERNATIONAL FINANCE  
(Theory)

Semester-VI

Credit: 5

**OBJECTIVES:**

1. To help the students understand the reason why financial markets exist,
2. To understand how financial institutions serve them and the services the institutions offer.
3. To provide students with an introduction to the theory and practice of financial markets and institutions.
4. To help students to gain a thorough understanding of the working of financial markets and of financial instruments.
5. To introduce the students to the management of financial markets and institutions in an international context.

**UNIT-I INTERNATIONAL FINANCIAL ENVIRONMENT:**

The Importance, rewards & risk of international finance- Goals of MNC- International Business methods – Exposure to international risk- International Monetary system- Multilateral financial institution

**UNIT-II INTERNATIONAL FLOW OF FUNDS AND INTERNATIONAL MONETARY SYSTEM:**

International Flow of Funds: Balance of Payments (Bop), Fundamentals of Bop, Accounting components of BOP, Factors affecting International Trade and capital flows, Agencies that facilitate International flows. BOP, Equilibrium & Disequilibrium. Trade deficits.

**UNIT-III -FOREIGN EXCHANGE MARKET:**

Function and Structure of the Forex markets, Foreign exchange market participants, Types of transactions and Settlements Dates, Exchange rate quotations, Nominal, Real and Effective exchange rates, Determination of Exchange rates in Spot markets.

**UNIT-IV INTERNATIONAL FINANCIAL MARKETS AND INSTRUMENTS:**

Foreign Portfolio Investment. International Bond & Equity market. GDR, ADR, Cross listing of shares Global registered shares. International Financial Instruments: Foreign Bonds & Eurobonds, Global Bonds. Floating rate Notes, Zero coupon Bonds, International Banking services –Correspondent Bank, Representative offices, Foreign Branches. Forward Rate Agreements

**UNIT-V FORECASTING FOREIGN EXCHANGE RATE:**

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Measuring exchange rate movements- Exchange rate equilibrium – Factors effecting foreign exchange rate- Forecasting foreign exchange rates. Interest Rate Parity, Purchasing Power Parity & International Fisher effect. Covered Interest Arbitrage

**CURRENT CONTOURS** (For continuous internal assessment only)

Faculty member will impart the basic concepts and theories of International financial market and instruments to the students.

## 22CMBEBM4 – INTERNATIONAL FINANCE

### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
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CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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Third Year

**SKILL BASED ELECTIVE COURSE –II  
BASICS OF GOODS AND SERVICE TAX  
(Theory)**

Semester-VI

Code:22CSBEBM2

Credit: 2

**LEARNING OBJECTIVES:**

- To Understand the Basics of GST.
- To Study the Registration and Computation of GST.
- To Acquaint the Students with Filing of Returns.
- To understand the concepts of GST technology.
- To explore the knowledge relating to the penalties and offences relating to GST.

**UNIT -I:**

Overview of Goods and Service Tax-Introduction - Meaning of GST - IGST - Scope of GST - Present/Old Tax Structure V/S GST - GST In Other Countries- Existing Taxes Proposed to be Subsumed Under GST-Principles Adopted for Subsuming the Taxes-Dual GST-Benefits of GST-GST Council-GST Network (GSTN) And GST Regime-Integrated Goods and Services Tax Act- 2017- Title and Definitions- Administration.

**UNIT- II:**

Registration Under GST -Rules-Procedure of Registration- Exempted Goods and Services Under GST - Rates of GST- GST at 5 % - GST at 12 % - GST at 18 % - GST at 28% - Procedure Relating to Levy (CGST &SGST) -Various Schedules Related to Supply - Computation of Taxable Value and Tax Liability [CSGT &SGST] -Procedure Relating to Levy (IGST)

**UNIT –III:**

Input Tax Credit (ITC)- Eligibility and Conditions for Taking Input Tax Credit- Apportionment of ITC and Blocked Credit -Various Documents Under GST- Tax Invoice-Bill for Supply- Debit Note- Credit Note- Payment Voucher- Receipt Voucher- E-Way Bill- HSN Code and SAC Code - Simple Problems on Utilization of Input Tax Credit

**UNIT-IV:**

Assessment and Administration of GST - Types of GST Returns- Types of Assessment &Assessment Procedures- Role and Functions of GST Council- Tax Authorities and Their Powers; Tax Deduction at Source &Tax Collection at Source- Refund of Tax-Offence and Penalties.

**UNIT –V:**

GST and technology -Introduction to GSTN – Power and Functions of GSTN – Design and Implementation Framework – Design &Implementation Framework GSTN. Goods and Service Tax Suvidha Provider (GSP) - Concept.

**Theory 80% Problems 20%**

**UNIT VI**

**CURRENT CONTOURS (for continuous internal assessment only)**

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## 22CSBEBM2 – BASICS OF GOODS AND SERVICE TAX

### MAPPING

CO – PO -PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

### B.COM BANK MANAGEMENT

PO-PSO CO	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	2	3	3	2	3	3
CO2	3	2	-	3	3	3	3	3	3
CO3	3	-	3	3	2	3	-	3	2
CO4	3	3	2	3	3	3	3	2	3
CO5	3	3	2	3	3	3	3	3	2
Average	2.8	2.2	2	2.8	2.8	3	2.2	2.8	2.6

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# SHRIMATI INDIRA GANDHI COLLEGE

Nationally Accredited at 'B' Grade (2<sup>nd</sup> Cycle) by NAAC | An MAE 10001 | 100% Girl's Institution  
Tiruchinappalli - 610 001

## DEPARTMENT OF ECONOMICS ODD SEMESTER

### PROGRAMME OUTCOMES

- **PO1:** Find a rewarding job in the organized job market in the private and the public sectors
- **PO2:** Start their own business like setting up own concerns or taking up consultancy services
- **PO3:** Undertake quality research for their own self / their organizations
- **PO4 :** Be better equipped in policy formulation and economic administration.
- **PO5:** Ability to use communication and soft skills effectively.

### PROGRAMME SPECIFIC OUTCOMES

- **PSO1:** Provide in-depth knowledge to the students on economic theory of utilization and allocation of resources like capital, labour and natural resources
- **PSO2:** Make students understand how markets for goods and services work and how income is generated and distributed
- **PSO3:** Inculcate students in the specific fields of Development Economics, Mathematical Economics, Agricultural Economics, Industrial Economics, International Economics, Financial Economics, etc.
- **PSO4:** Train students in Quantitative Techniques, Econometrics, etc.
- **PSO5:** Imbibe students with the economic history of the Indian Economy in particular and the Global Economy in General.

First year

CORE COURSE-I

Semester-I

MICRO ECONOMICS- I

Code: 22ACCEC 1 (Theory)

credit: 5

**OBJECTIVES:**

- To understand the scope of Micro Economics.
- To understand the laws related to consumer behavior theory.
- To gain knowledge about the theory of production.
- To familiarize students with concepts related to cost and revenue.
- To know the importance of welfare of the people in the study of Economics.
- To be cognizant of the contemporary theoretical developments in Micro Economics.

**UNIT - I INTRODUCTION TO MICRO ECONOMICS:**

Definition – Nature and Scope of Micro Economics – Methodology in Economics: Positive and Normative Economics – Static and Dynamic analysis – Deductive and Inductive methods – Choice as an economic problem – Basic postulates of Micro Economics.

**UNIT- II CONSUMER BEHAVIOUR THEORY:**

Law of demand – Elasticity of demand - Utility – Cardinal and Ordinal approaches – Law of Diminishing Marginal Utility – Law of Equi-marginal utility – Indifference curve analysis – Income, Substitution and Price effects – Consumer's equilibrium under IC analysis – Consumer's surplus.

**UNIT -III THEORY OF PRODUCTION:**

Production: Meaning and features – Production function – Production decisions – Law of Variable Proportions - Isoquants- Producer's equilibrium- Factors substitution – Returns to scale and Economies of scale.

**UNIT- IV COST AND REVENUE ANALYSIS:**

Cost concepts – Opportunity cost- Money Cost- Real Cost- Social Cost- Cost Function- Short-run and Long-run costs- Theories of costs – Total, fixed, variable and marginal costs – Relationship between AC and MC – AR and MR – Relationship between cost and revenue curves.

**UNIT- V WELFARE ECONOMICS:**

Welfare Economics: Meaning and features – Classical Welfare Economics – Concept of Value judgement – Pigou's Double criterion – Problems in measuring welfare - Concept of Social Welfare function – Pareto's Optimality conditions.

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Latest Developments in Micro Economics

**REFERENCES:**

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4. Varian, H.R. (2000), "Intermediate Micro Economics: A Modern Approach", East West Press, New Delhi.
5. Geoffrey A. Jehle and Philip J. Reny (2001), "Advanced Microeconomic Theory", Doling Kindersley(India) Pvt. Ltd., Noida.
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8. Agarwal & Verma, M.M. (1987), Micro Economics, Forwarded Book Depot- New Delhi.
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10. Agarwal S.K. (2007), General Economics- S.Chand & Company Ltd. New Delhi.

**COURSE OUTCOMES:**

**CO1:** Understand and analyse the traditional and modern definitions of Micro Economics

**CO2:** Analyse the impact of economic events on markets.

**CO3:** Inspect the behavior of consumers in terms of the demand for products.

**CO4:** Examine the performance of firms under different market situations.

**CO5:** Evaluate the elements affecting production and costs.

**MAPPING****CO -PO matrices of course**

1. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>Optimum point</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>



**Code: 22ACCEC 2      (Theory)      Credit: 5****OBJECTIVES:**

- To expose students to the basics of Tamil Nadu economy.
- To provide knowledge of the demographic and economic features of Tamil Nadu.
- To educate students about the agricultural and industrial development of Tamil Nadu.
- To enable students to assess the performance of Tamil Nadu economy.
- To make students understand the State Finances Development Policies of Tamil Nadu.
- To familiarize the students with the contemporary developments in the Tamil Nadu economy and Economic policy.

**UNIT –I A PROFILE OF THE TAMIL NADU ECONOMY:**

Tamil Nadu – Salient Features- Land Area – Distribution of occupational structure in Tamil Nadu – population of Tamil Nadu – Land use – Livestock – Forest resources – Human Resources – Infrastructure: Rural – Urban Education, Health, Banking, Power, Transport and Communication.

**UNIT- II AGRICULTURAL DEVELOPMENT:**

Agriculture – Land use – Cropping pattern – Principal Commodities – Irrigation – Green Revolution, Blue and White Revolution – Agricultural Marketing – Defects, remedial measures – Animal husbandry and fisheries – Agricultural Finance – Agencies – Government role – Self Help Groups and Microfinance.

**UNIT-III INDUSTRIAL DEVELOPMENT:**

Major Industries – Automobile, leather, cotton, sugar, cement, software – MSME, Cottage industries – Ancillary industries – Handloom industries – Tamil Nadu Government's role in industrial development – Industrial Financial Institutions – TIIC, SIDCO, SIPCOT, Industrial Estate, DIC, EPZ, SPZ, SEZ (Export Processing Zone, Special Processing Zone, Special Economic Zone).

**UNIT- IV CURRENT ISSUES AND WELFARE SCHEMES IN TAMIL NADU:**



State Finance – Revenue and Expenditure of the State – Tamil Nadu’s Recent Budget – Poverty Alleviation Programmes in Tamil Nadu – Healthcare and other Government Schemes – Unemployment Problem – Women Development Programmes.

**UNIT- V GENERAL PERFORMANCE OF THE STATE ECONOMY:**

Tourism Development in Tamil Nadu – Ports – Trade – Commerce – Role of Local bodies

- Industrial sector and its role – Science & Technology – Environmental Protective measures in Tamil Nadu.

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent developments in Tamil Nadu economy and economy policy.

**REFERENCES**

Leonard (2006), Tamil Nadu Economy, Macmillian, New Delhi.

1. Rajalakshmi, N. (1999), Tamil Nadu Economy, Business Publishers, Mumbai.
2. Perumalsamy, S. (1990), Economic Development of Tamil Nadu, S.Chand &Co. Ltd, New Delhi.

**COURSE OUTCOMES:**

**CO1:** Recall the demographic features of Tamil Nadu.

**CO2:** Outline the agricultural and rural development situation and policies of Tamil Nadu.

**CO3:** Elucidate the industrial development situation of Tamil Nadu.

**CO4:** Analyse the role of State Finance and Development Programmes in the Growth of Tamil Nadu.

**CO5:** Evaluate the General Performance of Tamil Nadu economy.


**MAPPING**

**CO -PO matrices of course**

1. Slight (low) 2, Moderate (medium) 3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>Optimum points</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>

  
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**OBJECTIVES:**

To explain the basic principles of commerce to the students.

- To enable the students to know the fundamentals of banking and insurance.
- To impart knowledge about the importance of advertisement and media.
- To provide knowledge about the types of financial sources.
- To familiarize students with the Principles of Management.
- To familiarize the students with the contemporary developments in the Principles of Commerce.

**UNIT- I FUNDAMENTALS OF COMMERCE:**

Fundamentals of Commerce – Forms of Business Organizations: Sole Proprietorship, partnership, company, cooperative, public and joint enterprises – Business combinations: Types – Causes and control of Monopoly Concentration.

**UNIT- II BANKING AND INSURANCE:**

Banks – Kinds – RBI – Structure – Objectives – functions – management – evaluation – SBI  
– functions – Cooperative Banks – Commercial Banks – Other Banks  
– Life Insurance – Fire – Marine – Deposit Insurance – Insurance against theft and loss.

**UNIT- III ADVERTISEMENT:**

Advertisement – importance – Media – Merits and demerits of media  
– wholesale and retail business – General and Special shops – Chain Stores – Multiple shops – Mail Order sales – Departmental Stores – super market – A to Z shops.

**UNIT- IV FINANCE:**

Finance – Working Capital and Fixed Capital – Shares and Debentures – Public Deposits – Ploughing back to profits – location of industries – balanced regional development.

**UNIT- V PRINCIPLES OF MANAGEMENT:**

Scientific management – Management Process – Planning – Organization – Staffing – direction – coordination – control – professionalization of management in India.

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent Developments in the Principles of Commerce and Management.

**REFERENCES:**

1. Sivayya, K.V. and Das, V.B.M.(1990) ,Indian Industrial Economy, Sultan Chand & Company Ltd, NewDelhi.
2. Bhushan, Y.K. (2010), Fundamentals of Business Combinations and Management, Sultan Chand & Sons,New Delhi.
3. Shukla, M.C.(2006), Business Organisation and Management, Sultan Chand & Company Ltd, New Delhi.
4. Gupta, C.B. (2012), Business Organisation and Management, Sultan Chand & Sons, New Delhi.
5. Yogendra Prasad Verma, (2008), Elements and Organization of Commerce, Sultan Chand & Company Ltd, New Delhi.

**COURSE OUTCOMES:**

**CO1:** Discuss the fundamentals of banking and insurance.

**CO2:** Examine the role of advertisement and media.

**CO3:** Analyze the role of finance in balanced regional development.

**CO4:** Assess the principles of management.

**CO5:** Become cognizant of the various recent developments in the principles of commerce and management.

**MAPPING**

**CO –PO matrices of course**

1.Slight (low) 2, Moderate (medium)3. Substantial (High)  
If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Optimum points</b>	3	3	3	3	3

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**Second Year**

**CORE COURSE-V  
MACRO ECONOMICS -I  
(Theory)**

**Semester-III**

**Code:22ACCEC 5**

**Credits: 5**

**OBJECTIVES:**

- To know the scope of Macro Economics.
- To understand the measurement of National Income.
- To gain knowledge about the classical theory of employment.
- To learn about the determination of effective demand.
- To make the students understand the theories of consumption.
- To become cognizant of the Contemporary Developments in Macroeconomic theory.

**UNIT- I THE NATURE AND SCOPE OF MACRO ECONOMICS:**

Introduction - Nature and Scope of Macro Economics- Limitations- Macro Statics – Macro Dynamics –Comparative Statics - Stock and Flow Concepts.

**UNIT -II NATIONAL INCOME ACCOUNTING:**

National Income – Concepts- Meaning –Measurement –Importance – Limitations – Circular Flow of Income and Expenditure – Social Accounting.

**UNIT –III THE CLASSICAL THEORY EMPLOYMENT:**

Introduction – Classical Theory of Employment –Keynes’ criticism of Classical Theory- Say’s Law of Markets- Meaning, Propositions and Implications of the Law – Criticism.

**UNIT –IV THE PRINCIPLES OF EFFECTIVE DEMAND:**

Effective Demand –Meaning – Aggregate Demand Price – Aggregate Supply Price – Determination of Effective Demand – Importance of Effective Demand – Keynesian Theory of Employment.

**UNIT –V CONSUMPTION FUNCTION:**

Meaning- Significance of MPC, Keynes’ Psychological Law of Consumption- Determinants of Consumption Function – Theories of Consumption Function- The Absolute Income Hypothesis – The Relative Income Hypothesis – Permanent Income Hypothesis.

**UNIT VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Contemporary Developments in Macroeconomic theory

**REFERENCES:**

1. M.L. Jhingan (2005), Macro Economic Theory, Vrinda Publications (P) Ltd, New Delhi.
2. Deepashree, Vanita Agarwal, (2007), Macro Economics, Tata McGraw –Hill Publishing Company Ltd, New Delhi.
3. Sankaran,S. (2006), Macro Economics, Margham Publications Chennai.
4. Ahuja, H.L. (2007), Macro Economics Theory and Policy – Advanced Analysis, S. Chand & Company Ltd, New Delhi.
5. Gupta, K.R., Mandal, R.K.and Anitha Gupta(2008), Macro Economics, Atlantic Publishers, New Delhi.

**COURSE OUTCOMES:**

- CO1:** Analyse the characteristics of Macro Economics
- CO2:** Evaluate the measures of National Income
- CO3:** Appreciate the implications of Classical theory of employment.
- CO4:** Understand the importance of effective demand.
- CO5:** Learn the applicability of consumption theories in real life situations.

**MAPPING**

**CO –PO matrices of course**

1. Slight (low) 2, Moderate (medium)3. Substantial (High)  
If there is no correlation, put

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	2	3
<b>CO5</b>	3	3	3	3	3
<b>Optimum points</b>	3	3	3	3	3



**Second Year**

**CORE COURSE-VI  
MONEY AND BANKING  
(Theory)**

**Semester-III**

**Code:22ACCEC6**

**Credits: 5**

**OBJECTIVES:**

- To enable the students to understand principles of note issue system.
- To gain knowledge about money market.
- To understand the system of banking.
- To understand the role and importance of State Bank of India and Lead banks.
- To know the impact of advancements in banking on the economy.
- To become cognizant of the various contemporary theoretical and empirical developments in Money and Banking.

**UNIT –I DEFINITION OF MONEY AND MONETARY STANDARDS:**

Definition and Meaning of Money – Characteristics of Money – Significance of Money- Evils of Money -Meaning of Monetary Standard- Forms of Monetary Standard- Principles of Note Issue Systems – Qualities of a Good Monetary Standard.

**UNIT –II MONEY MARKET:**

Meaning and Definitions of Money Market – Functions of Money Market –Instruments of Money Market – Characteristics of a Good Money Market – Importance of Money Market – Indian Money Market – Structure and Defects of Indian Money Market- Suggestions for the Improvement of Indian Money Market.

**UNIT –III INTRODUCTION TO BANKING:**

Origin of Banks -Meaning and Definition of a Bank - Characteristic Features of a Bank – Structure of Banking – Systems of Banking – Types of Banks - Social Responsibilities of Banks – Economic and Monetary Implications Banking.

**UNIT –IV BANKING AND NON-BANKING FINANCIAL INSTITUTIONS:**

SBI, Lead Bank Scheme - State Bank of India – Origin – Functions and its Role - Lead Bank Scheme - Origin of Lead Bank Scheme – OBJECTIVES- Functions- Working of Lead Bank Scheme- Criticisms.

**UNIT –V ADVANCEMENTS IN BANKING:**

Real Time Gross settlement (RTGS) – Know Your Customers (KYC) - Customer Identification Procedure – E-Capital Banking and its importance, Electronic Delivery channels – National Electronic Fund

Transfer (NEFT) - Automatic Teller Machine (ATM) - ATM Cards – Mobile banking – Internet Banking – Impact of information technology on banking.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :** Contemporary theoretical and empirical developments in Money and Banking

**REFERENCES:**

1. Mithani, D.M (2006), Money, Banking, International Trade and Public Finance, Himalaya Publishing House, Mumbai.
2. Dharmaraj, E.(2005), Banking Theory Law and Practice, Scitech Publications ( India) Pvt Ltd, Chennai.
3. Rajesh .R. Sivagnanathi,(2009), Banking Theory Law and Practice, Tata McGraw –Hill Publishing Company Ltd, New Delhi.
4. Shekhar, K.S. Lekshmy Shekhar( 2005), Banking Theory and Practice, Vikas Publishing House Pvt Ltd, New Delhi.
5. Jhingan, M.L.(2012), Money Banking, International Trade and Public Finance, Vrinda Publications (P) Ltd, Delhi.

**COURSE OUTCOMES**

**CO1:** Understand the prime factors and concepts of monetary economics and banking theory.

**CO2:** Appreciate simple articles related to monetary economics and banking theory.

**CO3:** Understand current events and concepts related to monetary economics and banking theory.

**CO4:** Acknowledge the importance of monetary phenomena in the economy.

**CO5:** Understand the role and function of RBI.

**MAPPING**

**CO -PO matrices of course**

2. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	3	2	3
<b>CO2</b>	2	2	3	2	3
<b>CO3</b>	2	2	3	2	3
<b>CO4</b>	2	2	3	2	3
<b>CO5</b>	2	2	3	2	3
<b>Optimum points</b>	2	2	3	2	3

**Second Year**

**SECOND ALLIED COURSE-I  
STATISTICAL METHODS**

**Semester-III**

**Code:22ASACEC3**

**(Theory)**

**Credits: 3**

**OBJECTIVES:**

- To equip the students with the knowledge of statistical tools needed for research and analysis.
- To impart knowledge on correlation and regression analysis.
- To inculcate skills to carry out Time Series analysis.
- To understand various methods of measuring Association of Attributes.
- To equip the students with the knowledge of testing of hypothesis.
- To make students aware of the various recent developments in Statistical Methods

**UNIT –I CORRELATION AND REGRESSION:**

Correlation - Meaning – Types of correlation –Methods of measuring correlation – Uses- Regression – Meaning - Difference between correlation and regression – Two regression lines- Regression Equations – Simple problems.

**UNIT –II ANALYSIS OF TIME SERIES:**

Meaning – Components of Time Series Analysis – Graphic method - Semi Averages Method  
- Moving Average Method – Merits and Demerits - Measurement of Cyclical and Irregular variations - Problems.

**UNIT- IIIASSOCIATION OF ATTRIBUTES:**

Association of Attributes - Meaning – Methods of measuring Association of Attributes- problems.

**UNIT –IV TESTING OF HYPOTHESIS:**

Testing of Hypothesis – Significance of formulating Hypothesis - Steps involved in testing of a Hypothesis – Concepts involved in formulation of Hypothesis – ‘t’ distribution and its properties – Uses (concepts only).

**UNIT –V CHI-SQUARE TEST:**

Chi-Square test – Meaning – Properties of Chi-square test – Uses (concepts only).



**UNIT –VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Recent Developments in Statistical Methods

**REFERENCES:**

1. Pillai R.S. N. & Bagavathi (2007) Statistics-Theory and Practice, S.Chand & Company Ltd, New Delhi -110055.
2. Gupta, S.P. (2002), Statistical Methods, Sultan Chand Sons &Co, New Delhi.
3. Arora, P.N., Sumeet Arora and Amit Arora (2009), Elements of Statistical Methods, Sultan Chand Sons & & Company Limited, Ram Nagar, New Delhi.

**COURSE OUTCOMES:**

**CO1:** Obtain knowledge on the statistical concepts, methods & techniques related to Economics.

**CO2:** Understand the significance and applicability of statistical analysis in Economics.

**CO3:** Gain knowledge on statistical analysis and hypothesis testing.

**CO4:** Identify the type of statistical situation to which different distributions and statistical tools can be applied.

**CO5:** Develop skills to carry out statistical analysis works.

**MAPPING**

**CO -PO matrices of course**

3. Slight (low) 2, Moderate (medium)3. Substantial (High)  
If there is no correlation, put

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Optimum points</b>	3	3	3	3	3

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**Third Year**

**CORE COURSE-IX  
PUBLIC FINANCE**

**Semester-V**

**Code: 22ACCEC 9**

**(Theory )**

**Credits: 5**

**OBJECTIVES:**

- To identify and discuss the role and importance of public finance.
- To know the various sources of public revenue and avenues of public expenditure.
- To understand the different kinds of taxation in India.
- To study the causes and effects of public debt.
- To impart awareness regarding the recent Finance Commission and its report.
- To familiarize students with the recent developments in Public Finance.

**UNIT –I PUBLIC FINANCE:**

Meaning and Scope – Uses and Role of Public Finance in the economy – Public finance and private finance – The principle of maximum social advantage.

**UNIT –II PUBLIC REVENUE AND PUBLIC EXPENDITURE:**

Sources of revenue of the centre and states – Recent trends – Tax Revenues – Non-tax Revenues – Role of Direct taxes – Income Tax – Corporate Tax - GST– Excise duty and customs duty – Wealth Tax – Capital gains Tax – gift Tax – Public Expenditure – general growth of public expenditure – causes, effects and control of expenditure.

**UNIT- III TAXATION:**

Principles of taxation – The cost of Service – The benefit – The ability to pay – The progressive and proportional Taxation – Direct and Indirect Taxes – Merits and demerits – VAT – shifting and incidence of taxation – effects of Taxation.

**UNIT –IV PUBLIC DEBT:**

Need for Public debt – Public debt and private debt – causes and effects of public debt – public debt redemption – recent trends – Public debt of the State Governments.

**UNIT -V FEDERAL FINANCE AND BUDGET:**

Evolution – Principles – Central – State Financial Relationship – Finance Commission – functions – The Recent Finance Commission and its report – Local Finance – Its trend in India – Fiscal policy – OBJECTIVES, uses and limitations – Fiscal policy in India – Budget – basic structure.

**UNIT –VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent developments in Public Finance

REFERENCES:

1. Dr.B.P.Tyagi(2003-04), Public Finance- Jai Prakash Nath & Company- Meerut
2. Dr.S.Sankaran(1985)Fiscal Economics-Shree Karthikeyan Publishing Company– Chennai
3. John Kennedy, (2012), Public Finance, PHI Learning Pvt Ltd, New Delhi.
4. K.P.M.Sundharam & K.K.Andley (1998), Public Finance Theory & Practice, Sultan & Sons Company Ltd , New Delhi.

**COURSE OUTCOMES:**

- **CO1:** Examine the role of public finance in the economy.
- **CO2:** Distinguish between tax revenue and non-tax revenue.
- **CO3:** Sketch out the shifting and incidence of taxation
- **CO4:** Explain the causes and effects of public debt
- **CO5:** Evaluate the Recent Finance Commission and its report

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**MAPPING**

**CO -PO matrices of course**

1. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	3	3	2	3
<b>CO2</b>	3	3	3	2	3
<b>CO3</b>	3	3	3	2	3
<b>CO4</b>	3	3	3	2	3
<b>CO5</b>	3	3	3	2	3
<b>Optimum points</b>	3	3	3	2	3

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**Third Year**

**CORE COURSE-X  
ECONOMICS OF GROWTH AND  
DEVELOPMENT**

**Semester-V**

**Code: 22ACCEC 10**

**(Theory)**

**Credits: 5**

**OBJECTIVES:**

- To study the factors affecting economic growth and development.
- To understand the various models regarding growth and development.
- To know the social and institutional aspects of development.
- To understand the various theories of development.
- To study the various approaches to development.
- To familiarize the contemporary approaches to growth and development.

**UNIT -I ECONOMIC GROWTH AND DEVELOPMENT:**

Economic Growth and development – Factors affecting economic growth - Capital, labour and technology growth models - Harrod and Domar, instability of equilibrium: Neo-classical growth models – Solow and Meade- Mrs. Joan Robinson’s growth model; Cambridge criticism of Neo-classical analysis of growth- The capital controversy.

**UNIT -II TECHNOLOGICAL PROGRESS:**

Technological progress - Embodied and disembodied technical progress: Hicks-Harrod - Learning by doing - Production function approach to Economic growth; Total factor productivity and growth accounting; Money in economic growth - Tobin, Levhari, Patinkin and Johnson, Endogenous growth- Intellectual capital - Role of learning education and research - AK Model - Explanations of cross country differentials in economic growth.

**UNIT -III SOCIAL AND INSTITUTIONAL ASPECTS OF DEVELOPMENT:**

Development and underdevelopment – Perpetuation of underdevelopment; Poverty - Absolute and relative; Measuring development and development gap - Per Capita income, Inequality of Income; Human Development Index and other indices of development and quality of life, Food security, Education, Health and Nutrition.

**UNIT -IV THEORIES OF DEVELOPMENT:**

Classical Theory of Development – Contributions of Adam Smith, Ricardo, Malthus and James Mill; Karl Marx and development of Capitalistic economy; Theory of social change, surplus value and profit; Immutable laws of capitalist development; Crisis in capitalism: Schumpeter and Capitalistic development – Innovation; Role of credit, profit and degeneration of capitalism; Structural analysis of development; Imperfect market paradigm.

## UNIT -V APPROACHES TO DEVELOPMENT:

Partial theories of growth and development; Vicious circle of poverty; Circular causation, unlimited supply of labor, big push; Balanced growth and unbalanced growth; Critical Minimum Effort Thesis; Low income equilibrium trap; Dualism-technical, behavioral and social; Ranis and Fei model; Dixit and Marglin model; Kelly etc. al Model; Dependency theory of development; Structural view of development.

## UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :

Contemporary approaches to growth and development

### REFERENCES:

1. Barrell, R.G Mason and M.O Mahoney (2000) Productivity, Innovation and Economic Performance, Cambridge University Press Cambridge
2. Hayami, Y (1997) Development Economics, Oxford University Press, New York
3. Sen, A.K (Ed) (1990) Growth Economics, Penguin, Harmondsworth
4. Mehrotra S and J. Richard (1998) Development with a Human Face, Oxford University press, New Delhi

### COURSE OUTCOMES:

- **CO1:** Examine the Neo-classical growth models.
- **CO2:** Explain the various growth and development models.
- **CO3:** Interpret the social and institutional aspects of development.
- **CO4:** Explain the various theories of development.
- **CO5:** Become cognizant of the contemporary approaches to growth and development.

### MAPPING

#### CO -PO matrices of course

2. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Optimum points	3	3	3	3	3

**Third Year**

**CORE COURSE-XI  
INTERNATIONAL ECONOMICS  
(Theory)**

**Semester-V**

**Code:22ACCEC11**

**Credits: 5**

**OBJECTIVES:**

- To study the theories of International Trade.
- To understand the differences between free trade and protection
- To learn about balance of payment.
- To impart knowledge about foreign exchange.
- To gain an understanding about the International Economic system
- To be updated about the recent developments in International trade and Economics

**UNIT –I THEORIES OF INTERNATIONAL TRADE :**

Meaning – Nature and Scope – Distinction between Internal and International trade; Classical Theory – Adam Smith’s Absolute Cost Theory - David Ricardo’s Comparative Cost Theory; Heberler’s Opportunity Cost Theory; Hecksher–Ohlin Theorem.

**UNIT –II FREE TRADE VERSUS PROTECTION:**

Case for and against free trade and protection; Tariffs – Meaning – Types – Effects – Quotas  
– Meaning – Types – Effects; Dumping – Pre-conditions for Dumping  
– Effects – Anti- Dumping measures.

**UNIT –III BALANCE OF PAYMENTS:**

Concept – Importance – Structure – Distinction between Balance of Trade and Balance of Payments – Disequilibrium in the Balance of Payments – Short run and Long run – Causes – Measures for removal of disequilibrium.

**UNIT –IV FOREIGN EXCHANGE:**

Meaning – Importance – Demand for Foreign exchange – Supply of Foreign exchange; Equilibrium rate of Foreign exchange – Purchasing Power Parity Theory; Stable and Flexible Foreign Exchange Rate.

**UNIT –V INTERNATIONAL COOPERATION AND MONETARY SYSTEMS:**

India and WTO, SAARC, ASEAN, BRICS, G20, BIMSTEC, QUAD;  
International liquidity  
– IMF – ADB

**UNIT VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

## Recent Developments in International trade and economics

### REFERENCES:

1. Jhingan, M.L. (2013), International Economics, Vrinda Publications(P) Ltd, Delhi.
2. Abdual Raheem & Vagheesan (2006), International Economics, Learntech Press, Trichy.
3. Desai, S.S. & Nirmal Bhalerao, (2003), International Economics, Himalaya Publishing House, Mumbai.
4. Mithani, D. M. (2003), International Economics, Himalaya Publishing House, Mumbai.
5. Cherunilam (2006), International Economics, Tata McGraw, Hill Publishing Company, New Delhi.
6. H.L. Bhatia (2006), International Economics, Vikas Publishing House Pvt LTD, New Delhi.

### COURSE OUTCOMES:

- **CO1:** Examine Classical and Neo-classical Theories of International trade.
- **CO2:** Explain the various aspects of free trade and protection.
- **CO3:** Distinguish between balance of trade and Balance of Payments.
- **CO4:** Understand the system of foreign exchange and theories associated with it.
- **CO5:** Evaluate the functions of various international economic institutions.

### MAPPING

#### CO -PO matrices of course

3. Slight (low) 2, Moderate (medium) 3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	3	3	2
<b>CO2</b>	2	2	3	3	2
<b>CO3</b>	2	2	3	3	2
<b>CO4</b>	2	2	3	3	2
<b>CO5</b>	2	2	3	3	2
<b>Optimum points</b>	2	2	3	3	2

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**Third Year**

**CORE COURSE-XII  
HISTORY OF ECONOMIC THOUGHT  
(Theory)**

**Semester-V**

**Code:22ACCEC 12**

**Credits: 5**

**OBJECTIVES:**

- To trace the historical development of economic theories.
- To understand institutional economic view of development.
- To know socialistic model of economic growth.
- To understand traditional and modern views of development.
- To understand important branches of Indian economic thought.
- To update students about the contemporary developments in Economic thought.

**UNIT –I PRE-CLASSICAL AND CLASSICAL THOUGHT:**

Mercantalism – Physiocracy – Classical school – Adam Smith, J.B.Say, Bentham, Ricardo, Malthus and J.S.Mill; Neo classical school – Alfred Marshall, J.R.Hicks and Allen.

**UNIT –II AUSTRIAN AND INSTITUTIONAL SCHOOL:**

Austrian school – Marginalism – Gossen, Jevons, Walras, Karl Menger and Von Wieser; Institutional school – Veblen, Commons, Mitchell.

**UNIT –III SOCIALISTIC THOUGHT:**

State Socialism – Saint Simon – Sismondi – Utopian Socialism – Robert Owen; Scientific socialism – Karl Marx and Engels.

**UNIT- IV HISTORICAL, KEYNESIAN AND WELFARE SCHOOLS:**

Historical school – Roscher, Hildebrand Schomoller; Keynesian school – J.M.Keynes; Welfare School – Pigou, Hobson and Pareto.

**UNIT –V INDIAN ECONOMIC THOUGHT:**

Thiruvalluvar – Gokale – Naoroji – Ranade – Jawaharlal Nehru – Mahatma Gandhi – E.V.Ramasamy – Amartya Sen.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Contemporary Economic Thought

**REFERENCES**



1. Hagela, (2000) History of Economic Thought, Konark Publications, New Delhi.
2. Sankaran S. (2000), A History of Economic Thought, Margham Publications, Madras.
3. Srivastava S.K. (2002), History of Economic Thought, Shultan Chand & Sons, New Delhi.
4. Hajela T.N. (2008), History of Economic Thought, Ane Books India, New Delhi.
5. Bhatia H.L. (2006), History of Economic Thought, Vikas Publishing House Pvt Ltd, New Delhi.
6. Gohosh, B.N. & Rama Ghosh (2006), Concise History of Economic Thought- Himalaya Publishing House, Mumbai.
7. Bhatia, H.L. (2006), History of Economic Thought, Vikas Publishing House Pvt Ltd, New Delhi.

**COURSE OUTCOMES:**

- **CO1:** Understand pre – classical, neo- classical schools of economic thought.
- **CO2:** Understand Austrian and Institutional schools of economic thought.
- **CO3:** Gain knowledge about socialistic school of thought.
- **CO4:** Understand historical, Keynesian and welfare schools of economic thought.
- **CO5:** Gain knowledge about Indian economic thought.


**MAPPING**

**CO -PO matrices of course**

4. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	2	2	2
<b>CO2</b>	2	2	2	2	2
<b>CO3</b>	2	2	2	2	2
<b>CO4</b>	2	2	2	2	2
<b>CO5</b>	2	2	2	2	2
<b>Optimum points</b>	2	2	2	2	2

  
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**Third Year**

**MAJOR BASED ELECTIVE COURSE- I**

**Semester-V**

**1. CAPITAL MARKET**

**Code:22AMBEEC1**

**(Theory)**

**Credits:5**

**OBJECTIVES:**

- To know about Capital Market and its growth.
- To understand various sources of Industrial Finance.
- To promote the ideas of corporate securities like equity shares, preference shares.
- To gain knowledge about stock market.
- To cultivate the ability to understand types of shares and its markets.
- To understand the contemporary developments in theory and practice of Capital Market.

**UNIT –I DEFINITION AND GROWTH OF CAPITAL MARKET:**

Capital Market: Definition – Growth- Concepts- Functions- Structure.

**UNIT –II SOURCES OF FINANCE:**

Long Term Finance: Sources- Financial Institutions- LIC- UTI- IDBI- ICICI- Public Deposit- Mutual Funds.

**UNIT –III CORPORATE SECURITIES:**

Corporate Securities - Equity Shares- Preference Shares – Debentures and Bonds- Convertible and Non- Convertible debentures- Full and Partly Convertible debentures- Global Depository Receipts.

**UNIT- IV STOCK EXCHANGE:**

Stock Exchange – Functions- Listing of Certificate- Dealers in Stock Exchanges – Role of Securities and Stock Exchange Board of India(SEBI) in the Regulation of share market.

**UNIT –V PUBLIC ISSUES OF SHARES:**

Public Issues of Shares – Primary Market – Secondary Market- Issues of shares at par and at premium- Right issues of shares – Issues of Bonus shares – Underwriting of shares- Merchant Banks- Foreign Institutional Investors.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Contemporary Developments in theory and practice of capital market

**REFERENCES:**

1. Avadhani, V.A.(2001), Capital Market Management, Himalaya Publishing House, Mumbai.
2. Gopalsamy,N.(2009), Capital Market, Macmillan Publishers India Ltd, Delhi.
3. Satya Prasad, B.G., Satish Bhat Udaya Chandra(2000), Industrial Finance, Himalaya Publishing House, Mumbai.

**COURSE OUTCOMES:**

- CO1:** Understand capital market and its origin.  
**CO2:** Understand the various sources of finance.  
**CO3:** Gain the knowledge importance corporate securities.  
**CO4:** Understand the importance of stock exchange market.  
**CO5:** Gain the knowledge about contemporary Developments in theory and practice of capital market

**MAPPING**

**CO -PO matrices of course**

5. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	3	3	3
<b>CO2</b>	2	2	3	3	3
<b>CO3</b>	2	2	3	3	3
<b>CO4</b>	2	2	3	3	3
<b>CO5</b>	2	2	3	3	3
<b>Optimum points</b>	2	2	3	3	3

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**Third Year**

**MAJOR BASED ELECTIVE COURSE -I Semester-V**  
**2. RESEARCH METHODS IN ECONOMICS**

**Code:22AMBEEC2**

**(THEORY)**

**Credits: 5**

**OBJECTIVES:**

- To understand the meaning and significance characteristics of scientific research.
- To know the formulation, selection of research problem and collection of reviews.
- To apply the various research design in the social science research.
- To enumerate the data and sampling methods.
- To discuss the report writing techniques and its procedures.

**UNIT –I INTRODUCTION:**

Research: meaning and significance Characteristics of Scientific Research - Type of Research: Pure, Applied, Analytical, Exploratory, Descriptive, Surveys, Case-Study - Limitations of Social Science Research - Role of Computer Technology in Research.

**UNIT –II RESEARCH PROBLEM AND REVIEW OF LITERATURE:**

Research Problem: formulation and selection - necessity of defining the problem – Review of literature: Primary and Secondary Sources - importance of literature review in defining a problem - identifying gap areas from literature and research database.

**UNIT –III RESEARCH DESIGN:**

Research Design: Concept and Importance in Research – Features of a Good Research Design – Exploratory Research Design – Descriptive Research Design – Experimental Design: Concept of Independent & Dependent variables.

**UNIT- IV DATA AND SAMPLING METHODS:**

Data types: Qualitative and Quantitative - Sources of Primary and secondary data - Census - Sampling Methods: Probability and Non-Probability Sampling Methods - Sampling and Non- Sampling Errors.

**UNIT –V HYPOTHESIS AND REPORT WRITING:**

Hypothesis: Types of Hypothesis - Null and Alternative Hypothesis - Parameter and Statistic

- Type I and Type II Errors - Level of Significance and Critical Region - Report Writing - Types and Principles of writing the Research Report.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Recent Developments in Research Tools in Economics.

**REFERENCES:**

1. Krishnaswamy, O.R. (1993) Methodology of Research In Social Sciences, Himalaya publishing House.
2. Kothari, C. R. (2004). Research Methodology: Methods and techniques. New Age International
3. Vinod Chandra, Anand Hareendran, “Research methodology”, Pearson, 2017
4. R.Pannerselvam, “Research Methodology”, PHI learning,2014
5. Ranjit Kumar, “Research Methodology”, Sage Publication, 2010
6. Taylor, B., Sinha, G., & Ghoshal, T. (2006). Research methodology: A guide to for researchers in management and social sciences. PHI Learning Pvt. Ltd
7. Bhandarkar, P. L., Wilkinson, T. S., & Laldas, D. K. (2010). Methodology & Techniques of Social Research. Himalaya Publishing House
8. Kumar, A. (2002). Research methodology in social science. Sarup & Sons
9. Daniel, P. S., & Sam, A. G. (2011). Research methodology. Gyan Publishing House
10. Ethridge, D. (2004). Research methodology in applied economics: organizing, planning, and conducting economic research, Blackwell publishing

**COURSE OUTCOMES:**

- CO1:** Understand the overview of Social Science Research.  
**CO2:** Analyze the Research Process.  
**CO3:** Develop the Statistical Analysis to test Economic Theory and address Policy Issues.  
**CO4:** Know the sampling methods in Research.  
**CO5:** Explain the hypothesis testing and Principles of Report Writing.

**MAPPING**

**CO -PO matrices of course**

6. Slight (low) 2, Moderate (medium) 3, Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	3	3	2	2
<b>CO2</b>	3	2	2	2	2
<b>CO3</b>	3	3	3	2	3
<b>CO4</b>	3	2	2	2	2
<b>CO5</b>	3	3	3	2	3
<b>Optimum points</b>	3	3	3	2	2



# SHRIMATI INDIRA GANDHI COLLEGE

Nationally Accredited till 'B' Grade (3<sup>rd</sup> Cycle) by NAAC | An ISO 9001 : 2015 Certified Institution  
Tiruchirappalli - 620 003

## DEPARTMENT OF ECONOMICS EVEN SEMESTER

### PROGRAMME OUTCOMES

- **PO1:** Find a rewarding job in the organized job market in the private and the public sectors
- **PO2:** Start their own business like setting up own concerns or taking up consultancy services
- **PO3:** Undertake quality research for their own self / their organizations
- **PO4 :** Be better equipped in policy formulation and economic administration.
- **PO5:** Ability to use communication and soft skills effectively.

### PROGRAMME SPECIFIC OUTCOMES

- **PSO1:** Provide in-depth knowledge to the students on economic theory of utilization and allocation of resources like capital, labour and natural resources
- **PSO2:** Make students understand how markets for goods and services work and how income is generated and distributed
- **PSO3:** Inculcate students in the specific fields of Development Economics, Mathematical Economics, Agricultural Economics, Industrial Economics, International Economics, Financial Economics, etc.
- **PSO4:** Train students in Quantitative Techniques, Econometrics, etc.
- **PSO5:** Imbibe students with the economic history of the Indian Economy in particular and the Global Economy in General.

**First Year**

**CORE COURSE- III    MICRO ECONOMICS II**  
**Code: 22ACCEC 3    (Theory)**

**Semester-II**

**Credit: 5**

**OBJECTIVES:**

- To help the students understand the determination of prices of goods and services under different market structures.
- To educate the students about the price and output determination in monopoly.
- To aid the students in distinguishing the price and output determinations in imperfect competition with more than oneseller.
- To familiarize students with the theories of rent and wages.
- To make the students understand the postulates of interest and profit.
- To familiarize the students with the contemporary developments in the Micro economic theory and policy.

**UNIT – I PRICE DETERMINATION UNDER PERFECT COMPETITION:**

Market Structure – Classification of Markets - Perfect Competition – Meaning- Features - Short run & Longrun - Price and Output Determination under Perfect Competition

**UNIT- II PRICE DETERMINATION UNDER MONOPOLY:**

Meaning – Features of Monopoly – Price and Output Determination under Monopoly - Price Discrimination -Meaning – Price Discrimination under Monopoly.

**UNIT- III MONOPOLISTIC COMPETITION:**

Monopolistic Competition – Features – Price and Output Determination under Monopolistic Competition - Selling Cost and Excess Capacity – Oligopoly – Meaning- Features- Kinked Demand Curve – Monopolistic Competition vs Joan Robinson’s Imperfect Competition.

**UNIT- IV THEORIES OF RENT AND WAGES:**

Theories of Rent – Ricardian theory of Rent - Modern Theory of Rent – Quasi-rent – Theories of Wages – The Subsistence Theory of Wages – Wage Fund Theory- Marginal Productivity Theory of Wages.

**UNIT- V THEORIES OF INTEREST AND PROFIT:**

Theories of Interest – Classical Theory of Interest – Neo-Classicals’ Loanable Funds Theory

- Modern Theory of Interest - Theories of Profit – Schumpeter’s Innovation Theory - Knight’s Uncertainty Bearing Theory.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent developments in Microeconomic theory and practice

**REFERENCES:**

1. Ahuja H.L. (2003), Advanced Economic Theory, S.Chand & Co. Ltd, New Delhi.
2. Seth, M.L. (2001), Principles of Economics, Lakshmi Narain Agarwal, Agra.
3. Sankaran, S.(2000), Micro Economics, Margham Publications, Chennai.
4. Dutt & Sundaram(1990), Micro Economics, S. Chand & Co Ltd, New Delhi.
5. Agarwal & Verma, M.M. (1987), Micro Economics Forwarded Book depot- NewDelhi.
6. Cauvery,R., Sudhanayak, U.K. Girija, M., Kruparani N., and Meenakshi, R. (1998), Micro Economic Theory, S. Chand & Co . Ltd, New Delhi.
7. Agarwal S.K. (2007), General Economics-S.Chand & Company Ltd. New Delhi.

**COURSE OUTCOMES:**

- CO1:** Understand the factors involved in price determination under perfect competition.
- CO2:** Asses the price determination factors in monopoly.
- CO3:** Evaluate the methods of fixing prices under imperfect competition.
- CO4:** Analyze the impact of rent and wages with theories.
- CO5:** Understand the interpretations of the various postulates of profit and interests.

**MAPPING**

**CO -PO--PSO matrices of course**

1. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	2	2	3	2
<b>CO2</b>	3	2	2	2	2
<b>CO3</b>	3	3	2	3	3
<b>CO4</b>	3	3	2	2	2
<b>CO5</b>	3	3	2	3	3
<b>Optimum point</b>	3	3	2	3	2



**INDIAN ECONOMIC DEVELOPMENT**

**Code: 22ACCEC 4      (Theory)**

**Credit: 5**

**OBJECTIVES:**

- To make the students understand the nature and structure of Indian economy.
- To analyze the problem of poverty in India and the various government schemes for eradication of poverty.
- To identify the various farming methods used in Indian Agriculture.
- To familiarize the features of Indian industrial sector to the students.
- To elucidate the importance of transport and labour in economic development and the various challenges faced.
- To make the students aware of the various contemporary developments in Indian economy an Indian Economic Policy.

**UNIT- I      ECONOMIC DEVELOPMENT AND NATIONAL INCOME:**

Economic growth and development – Determinants of economic growth – Features of Indian Economy – Economic and Non-economic factors – Barriers to economic development - Covid-19 issues – National Income: Methods of measuring National Product

- Trends – Difficulties in measuring National Income – Social Accounting.

**UNIT- II POPULATION, POVERTY AND UNEMPLOYMENT:**

Population Growth – Age composition – Occupational distribution – Demographic theory: Causes, effects and remedial measures – Population policy – Poverty: Rural and urban poverty – Causes – Poverty alleviation Programmes – Unemployment: Types, Causes and effects – Employment generation programmes.

**UNIT- III AGRICULTURE:**

Agriculture and its role – Productivity – Causes for Low productivity in Agriculture – Land reforms – Government measures – Agricultural development under Five Year Plans.

**UNIT- IV INDUSTRIES:**

Role of Cottage MSMEs and Large scale industries – Industrial policies of 1948, 1956, 1991 and recent changes – Problems of rural industries – Government remedial measures to solve the problems – Industrial development under Five Year Plans – Liberalization, Privatization and Globalization.

**UNIT- V                      ROLE OF TRANSPORT AND LABOUR IN  
ECONOMIC DEVELOPMENT:**

Role of Transport in Economic Development – Transport coordination – Labour: Causes for low productivity – Labour unrest – Trade unionism – Labour problems – Government measures – Wage policy – Social security measures – Recent trends in Labour and Labour policy in India.

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent Developments in Indian Economic Development.

**REFERENCES:**

1. Agarwal.A.N. (2004) Indian Economy, Wishwa Prakashan, New Delhi.
2. Ahulwalia.I.J. and I.M.D.Little (eds.) (1999), India’s Economic Reforms and Development (essays in honour of Manmohan /Singh), Oxford University Press, New Delhi.
3. Pantwala.S (1987), Dilemmas of Growth: Indian Experience, Sage Publications, New Delhi.
4. Dhingra.C (2003), The Indian Economy, Sultan & Chand, New Delhi.
5. Jalan.B (1992), The Indian Economy Problems and Prospects, Viking, New Delhi.

**COURSE OUTCOMES**

**CO1:** Analyze the basic issues in growth and development with a historical and general perspective.

**CO2:** Gain a comparative Perspective on key Issues related to Poverty, Inequality, Education, Health and Gender.

**CO3:** Evaluate the Policies and Performance of Agriculture and Industry.

**CO4:** Identify various Economic Reforms related to the primary and secondary Sectors.

**CO5:** Determine and analyze the Female Labour Force Participation in India.

**MAPPING**

**CO -PO--PSO matrices of course**

2. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	3	2	3	3	3
<b>CO2</b>	2	2	3	3	2
<b>CO3</b>	3	2	3	3	3
<b>CO4</b>	3	2	3	3	2
<b>CO5</b>	3	2	2	3	3
<b>Optimum point</b>	3	2	3	3	3

**OBJECTIVES:**

- To give a basic understanding about statistics and sampling.
- To inculcate knowledge of tabular and diagrammatic representation of data.
- To familiarize the concept of central tendency and the various measures and methods of calculating central tendency.
- To elucidate the concept of dispersion and skewness and the various measures and methods of calculating dispersion and skewness.
- To provide an overview of the history and operation of Indian Statistics.
- To gain an understanding of the recent developments in Economic Statistics.

**UNIT- I    NATURE, SCOPE OF STATISTICS AND SAMPLING:**

Meaning - Nature and Scope of Statistics - Functions- Limitations  
- Collection of Data- Primary and Secondary sources – Methods of Sampling.

**UNIT- II**

**CLASSIFICATION, TABULATION AND DIAGRAMMATIC REPRESENTATION:**

Classification – Meaning- Characteristics of classification – Types of classification- Tabulation of Data- Meaning- Objects, Difference Between classification and Tabulation- Parts of Tabulation- Types of Tables – Diagrammatic and Graphic Representation- Advantages of Diagrammatic and Graphic Representation- Types of Diagram- Graphs- Histogram – Frequency Polygon – Limitations of diagrams and graphs.

**UNIT- III MEASURES OF CENTRAL TENDENCY:**

Characteristics of a Good Average-Arithmetic mean- Median- Mode- Harmonic Mean- Geometric Mean-Simple problems.

**UNIT-IV MEASURES OF DISPERSION:**

Meaning of Dispersion – Range - Quartile Deviation- Mean Deviation- Standard Deviation- Coefficient of Variation- Simple problems- Lorenz curve.

**UNIT- V SKEWNESS AND INDIAN STATISTICS:**

Skewness – Meaning- Karl Pearson, Bowley and Kelly's Measures of Skewness- Simple Problems- Growth and Origin of Indian Statistics – National Sample Survey Organisation (NSSO) – Central Statistical Organisation (CSO) - Industrial Statistics – Census of Manufacturing Industries (CMI) – Sample Survey of Manufacturing Industries (SSMI) – Annual Survey of Industry (ASI) - Population Statistics.

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent Developments in Economic Statistics

**REFERENCES:**

1. Pillai R.S. N. & Bagavathi (2007) Statistics-Theory and Practice, S.Chand & Company Ltd, New Delhi -110055.
2. Gupta, S.P. (2002), Statistical Methods, Sultan Chand Sons &Co, New Delhi.
3. Arora, P.N. Sumeet Arora and Amit Arora (2009), Elements of Statistical Methods, Sultan Chand Sons && Company Limited, Ram Nagar, New Delhi.

**COURSE OUTCOMES:**

- CO1:** Examine the nature and scope of statistics.
- CO2:** Summarize the Difference Between classification and Tabulation
- CO3:** Solve problems related to Arithmetic mean, Median and Mode
- CO4:** Solve problems related to various measures of dispersion.
- CO5:** Learn to evaluate the Karl Pearson, Bowley and Kelly’s Measures of Skewness

**MAPPING**

**CO -PO--PSO matrices of course**

3. Slight (low) 2, Moderate (medium)3. Substantial (High)  
If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	3	2	3	2
<b>CO2</b>	3	2	3	2	2
<b>CO3</b>	2	3	2	3	3
<b>CO4</b>	3	3	3	3	2
<b>CO5</b>	2	3	2	3	3
<b>Optimum point</b>	2	3	2	3	2

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Second Year

**CORE COURSE-VII  
MACRO ECONOMICS - II**

Semester-IV

Code:22ACCEC7

(Theory)

Credits: 5

**OBJECTIVES:**

- To make the students understand the Macroeconomic concepts.
- To understand the Macroeconomic relevance to the economy.
- To understand and to examine how the Macroeconomic concepts are used in policy framework.
- To make the student acquire the skill of calculating various cost and revenues in the process of production.
- To make students capable of analyzing individual rationality in situation of scarcity and choice.
- To familiarize students with the various contemporary developments in Macroeconomic theory and practice.

**UNIT –I THE INVESTMENT FUNCTION:**

Meaning of Capital and Investment – Types of Investment (Induced vs Autonomous), Determinants of Investment – Marginal Efficiency of Capital (MEC)- Relation between MEC and MEI – Factors other than the interest rate affecting inducement to invest.

**UNIT –II THE CONCEPT OF MULTIPLIER:**

The Investment Multiplier – Working of the Multiplier – Assumptions to Multiplier- Leakages of Multiplier – Criticism of Multiplier – The Dynamic Multiplier- The Employment Multiplier.

**UNIT –III BALANCED BUDGET**

**MULTIPLIER AND FOREIGN TRADE**

**MULTIPLIER:**

Balanced Budget Multiplier – its Assumptions, its Criticism- Foreign Trade Multiplier- Criticism of the Foreign Trade Multiplier.

**UNIT –IV THE PRINCIPLES OF ACCELERATION AND SUPER MULTIPLIER:**

Acceleration – Meaning- The principles of Acceleration – Operation of the Acceleration principle – Assumptions-Criticism- The Super Multiplier or the Multiplier and Accelerator Interaction – Use of Multiplier and Acceleration interaction in Business Cycles.

**UNIT –V GENERAL EQUILIBRIUM:**

General Equilibrium: Hicks - Hansen Analysis – Derivation of IS - LM Curves- Keynes effect and Pigou effect – IS-LM Equilibrium – OBJECTIVES of Macro Economic Policy – Monetary and Fiscal Policy Measures.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal**

**Assessment Only):** Contemporary theoretical and empirical

developments in Macro Economics **REFERENCES:**

1. M.L. Jhingan (2005), Macro Economic Theory, Vrinda Publications (P) Ltd, New Delhi-110091.

2. Dwivedi, D.N., (2005), Macro Economics: Theory and Policy, Tata McGraw Hill Publishing Company Ltd., New Delhi.
3. Sankaran,S. (2006), Macro Economics, Margham Publications Chennai.
4. Ahuja, H.L.(2007), Macro Economics Theory and Policy – Advanced Analysis, S. Chand & Company Ltd, New Delhi.
5. Gupta, K.R., Mandal, R.K.and Anitha Gupta(2008), Macro Economics, Atlantic Publishers, New Delhi.

### **COURSE OUTCOMES:**

**CO1:** Evaluate the relationship between GNP and the standard of living of a nation.

**CO2:** Learn about the rationale for the study of national income accounts.

**CO3:** Understand the various theories of Classical and Keynesian school of thought.

**CO4:** Become familiar with the psychology of consumers with respect to consumption pattern

**CO5:** Become aware of fiscal and monetary policies and their relevance to Indian economy.

### **MAPPING**

#### **CO -PO--PSO matrices of course**

1. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	2	3	2	3	2
<b>CO2</b>	2	2	3	2	2
<b>CO3</b>	2	3	3	3	3
<b>CO4</b>	2	2	3	2	2
<b>CO5</b>	2	3	2	3	3
<b>Optimum point</b>	2	3	3	3	2

**Second Year**

**CORE COURSE-VIII  
MONETARY ECONOMICS  
(Theory)**

**Semester-IV**

**Code:22ACCEC8**

**Credits: 5**

**OBJECTIVES:**

- To familiarize the concepts related to Monetary Economics and their practical applicability.
- To introduce the Post Keynesian monetary policy model, its goals, tools, and channels.
- To understand the ways of efficient operation of the economic system or set of specific OBJECTIVES through its influence on the supply, cost and availability of money.
- To learn the concepts relating to Monetary Economics and their practical applicability.
- To understand the ways of efficient operation of the economic system or set of specific OBJECTIVES through its influence on the supply, cost and availability of money.
- To introduce the contemporary theoretical and empirical developments in Monetary Economics.

**UNIT- I EVOLUTION OF MONEY:**

Evolution and Functions of Money – Forms of Money – Money and Near Money – Supply of Money (M1, M2, M3 and M4) – Value of Money – Quantity Theory of Money – Fisher’s version – Cambridge version.

**UNIT –II DEMAND FOR MONEY:**

Demand for Money – Keynes’s theory of Demand for money – Friedman’s Restatement of the quantity theory of money – Patinkin’s Real Balance Effect – Tobin’s portfolio balance theory.

**UNIT-III BANKING:**

RBI – Origin - Functions – Repo rate, Reverse rate, Cash Reserve Ratio, SLR, Commercial Banking Functions – Balance Sheet – Credit Creation – Nationalization of Banking – Performance of Public sector Banks in India – Open market operations – Quantitative measures.

**UNIT –IV TRADE CYCLE:**

Trade Cycle – Causes and control - Phases of Trade Cycle – Theories of Trade Cycle – Schumpeter – Hawtrey – Hicks and Samuelson.

**UNIT –V INFLATION:**

Economics of Inflation – Meaning – Types – Causes and Measures – Theories: Demand Pull, Cost-Push and Structural Inflation – Phillips Curve – Stagflation.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Contemporary theoretical and empirical developments in Monetary Economics

**REFERENCES:**

1. Mithani, D.M. (1997), Money, Banking, International Trade and Public Finance, Himalaya Publishing House, New Delhi.
2. Seth, M.L. (2001), Monetary Economics, Lakshmi Varain Agarwal – Agra.
3. Jhingan, M.L. (2003), Monetary Economics, Virnda Publications (P) Ltd, Delhi.
4. Dwivedi, D.N. (2005), Macro Economics: Theory and Policy, Tata McGraw Hill Publishing Company Ltd, New Delhi.

**COURSE OUTCOMES:**

- CO1:** Understand how the value of money is determined.
- CO2:** Gain knowledge about the derivation of Phillips curve from aggregate supply curve.
- CO3:** Understand the theories of demand for money.
- CO4:** Understand the importance of exchange rate.
- CO5:** Gain knowledge about the Financial Market.

**MAPPING**

**CO -PO--PSO matrices of course**

2. Slight (low) 2, Moderate (medium)3. Substantial (High)  
If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	3	3	3	2
<b>CO2</b>	3	3	3	2	2
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	2	2
<b>CO5</b>	3	3	3	3	3
<b>Optimum point</b>	3	3	3	3	2





**Second Year                      SECOND ALLIED COURSE-      Semester IV**  
**II MATHEMATICS FOR ECONOMICS**  
**Code: 22AFACEC4 (Theory)      Credits: 3**

**OBJECTIVES:**

- To familiarize the mathematical concepts related to Economics and their applications and equip students with quantitative skills and impart knowledge on the analysis of problems with empirical evidence.
- To help students acquire mathematical knowledge on the measures of central tendency and dispersion.
- To equip the students with the knowledge of statistical tools related to probability analysis.
- To familiarize students with correlation and regression analysis.
- To inculcate problem solving knowledge and skills
- To make students familiar to contemporary developments in Mathematics for Economics.

**UNIT – I MEASURES OF CENTRAL TENDENCY:**

Application of Measures of Central Tendency – Computing Mean, Median, Mode, Geometric Mean, Harmonic Mean and Weighted Averages.

**UNIT – II MEASURES OF DISPERSION:**

Use of Measures of Dispersion– Computing Range, Mean Deviation, Quartile Deviation, Standard Deviation and Coefficient of Variation – Significance of Dispersion in Decision Making.

**UNIT – III                      PROBABILITY:**

Probability - Meaning of Probability – Steps of Probability – Approaches of Probability – Rules of Probability (Addition & Multiplication) – Simple problems.

**UNIT – IV CORRELATION:**

Correlation Analysis – Types of Correlation – Interpretation of ‘r’ in analysis – Application of Correlation in Empirical Works and in Decision Making.

**UNIT – V REGRESSION ANALYSIS:**

Methods of Estimation of Regression Coefficient – Simple Linear Regression Model, Multiple Linear Regression Model.

**UNIT VI CURRENT CONTOURS (For Continuous Internal AssessmentOnly):**

Contemporary developments in Mathematics for Economics

**REFERENCES:**

1. Chiang A.C. (2005). Fundamental methods of mathematical Economics. McGraw Hill, New York.
2. Gupta S.P, (2012) Statistical methods, Sultan Chand & Sons, New Delhi
3. Richard I Levin et.al.(2020) Statistics for management. India: Pearson Education, Hong Kong.
4. Sharma J.K, (2007) Business statistics. Pearson Education, New Delhi
5. Srivastava U.K et.al,(2010)Quantitative techniques for managerial decisions, New Age International Publishers, New Delhi.
6. Allen R.G.D, (2006), Mathematical analysis for economists. Palgrave Mac Millan.
7. Bradley Terasa, (2017) Essential mathematics for economics and business. New Delhi Wiley India Edn, New Delhi
8. Elhance D.N, (2018) fundamentals of statistics, Kitab Mahal, Wholesale Division, Allahabad.
9. Monga G.S, (2000) Mathematics and statistics for economists. Vikas Publishing House.

**COURSE OUTCOMES:**

**CO1:** Gain knowledge on applying mathematical tools to simple problems in Economics.

**CO2 :** Learn the concept of differentiation and its application in Economics.

**CO3:** Understand the uses of derivatives in maximization and minimization

**CO4:** Gain knowledge on the concept of integration and its application in Economics.

**CO5:** Learn the basic operations and properties of matrices

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**MAPPING**

**CO -PO matrices of course**

3. Slight (low) 2, Moderate (medium)3. Substantial (High)  
If there is no correlation, put

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	2	2	3	3	2
<b>CO2</b>	2	2	2	2	2
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	2	2	3	2	2
<b>CO5</b>	3	3	3	3	3
<b>Optimum point</b>	2	2	3	3	2

**Second Year                      NON MAJOR ELECTIVE COURSE-II                      Semester-IV**  
**ECONOMICS FOR COMPETITIVE**  
**EXAMINATIONS**

**Code:**    **(Theory)**    **Credits: 2**

**OBJECTIVES:**

- To understand the basic Economic Growth Concepts.
- To explore the Development of Indian Economy over the years.
- To understand the concepts of Income Classification, Poverty and Employment.
- To understand the Tax Structure and Fiscal Federalism in India.
- To understand the Banking and Trade aspects of India.

**UNIT – I ECONOMIC CONCEPTS:**

Economic Growth and Development – Measurement - GDP, GNP, NDP, NNP, PCI, HDI – Current Trends.

**UNIT – II NATURE OF INDIAN ECONOMY:**

Agricultural, Industrial and Service Sectors – Five Year Plans before and after Liberalisation – NITI AYOJ and Recent Developments.

**UNIT – III                      INCOME AND EMPLOYMENT:**

Income Classifications (NSS) - Poverty and Poverty Line - Anti-Poverty and Employment Generation Programmes - MGNREGP.

**UNIT – IV PUBLIC FINANCE:**

Direct and Indirect Taxes - Personal IT, Corporate IT, Sales Tax, VAT, GST, Excise Duty, Customs Duty, Local Taxes - Fiscal Federalism and Finance Commissions.

**UNIT – V MONEY, BANKING AND TRADE:**

Money Supply – M1, M2, M3 & M4 – Inflation – RBI – Functions and Role – Commercial Banks and NBFCs – Export and Import – Major Commodities – Balance of Payments – IMF and World Bank – Role.

**UNIT VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Recent                      Developments                      in                      Indian                      Economy.

REFERENCES:

1. A V Balakrishnan, (2022, 3<sup>rd</sup> Ed., Economic Development in India (Policies, Reforms and Liberalisation), GK Publications, G.K. Publications Pvt Ltd.
2. Economic Survey, Government of India, 2022.
3. Mishra, Puri, Garg (2022, 40<sup>th</sup> Ed.), Indian Economy, Himalaya Publishing House, New Delhi.
4. Ramesh Chand, Pramod Joshi (2022, 1<sup>st</sup> Ed.) Indian Agriculture Towards 2030: Pathways for Enhancing Farmers' Income, Nutritional Security and Sustainable Food and Farm Systems. Springer Verlag, Singapore.
5. Reserve Bank of India, Report of Currency and Finance, (Annual).
6. Sanjay Kaul (2022, 1<sup>st</sup> Ed.), An Alternative Development Agenda for India, Taylor & Francis Ltd.
7. Uma Kapila (2022, 23<sup>rd</sup> Ed.), Indian Economy: Performance and Policies, Academic Foundation.
8. Uma Kapila (2022, 33<sup>rd</sup> Ed.), Indian Economy since Independence, Academic Foundation.

**COURSE OUTCOMES:**

**CO1:** Explain the basic Economic Growth Concepts with data.

**CO2:** Examine the various development aspects of the Indian Economy over the years.

**CO3:** Analyze the income structure and poverty issues in India.

**CO4:** Explain the Tax Structure and Fiscal Federalism in India.

**CO5:** Examine the Banking and Trade aspects of India.

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**MAPPING**

**CO -PO matrices of course**

4. Slight (low) 2, Moderate (medium)3. Substantial (High)  
If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	3	2	3	2
<b>CO2</b>	2	2	2	3	2
<b>CO3</b>	2	3	2	3	3
<b>CO4</b>	2	3	2	3	2
<b>CO5</b>	2	3	2	3	3
<b>Optimum point</b>	2	3	2	3	2

**Third Year**

**CORE COURSE-XIII  
AGRICULTURAL ECONOMICS  
(Theory)**

**Semester-VI**

**Code:22ACCEC13**

**Credits: 5**

**OBJECTIVES:**

- Study the role of agricultural development in Indian Economy.
- Gain knowledge about the structural and institutional changes in agriculture.
- Understand the various sources of agricultural finance.
- Examine the role, functions of efficient marketing system and agricultural price policy.
- Make students understand the problems of agricultural labourers.
- Make students informed about the contemporary developments in Agricultural Economics.

**UNIT –I AGRICULTURAL DEVELOPMENT:**

Agricultural Development – Role of Agriculture in Indian Economy-  
Agricultural Development under Five Year Plans- Productivity in  
Agriculture – Causes for Low Productivity- Measures to improve  
Productivity.

**UNIT –II STRUCTURAL AND  
INSTITUTIONAL CHANGES IN  
AGRICULTURE:**

New Agricultural Strategy – New Economic Policy and Agriculture –  
Mechanisation – Advantages and Limitations- Farm Size and  
Efficiency – Land Reforms – Measures – Progress- Suggestions for  
improvement.

**UNIT –III AGRICULTURAL FINANCE AND AGENCIES:**

Capital formation in Agriculture – Sources of Agricultural Finance-  
Rural Indebtedness – Causes- Debt relief activities – Role of Rural  
Credit Institutions.

**UNIT –IV AGRICULTURAL MARKETING:**

Recent State of Agricultural Marketing- Role and Functions of  
efficient marketing system – Marketable surplus - Agricultural Price  
Policy - Regulated Markets - Co-operative Marketing  
– Procurement and Public Distribution.

**UNIT –V AGRICULTURAL LABOUR:**

Problem of Agricultural Labour –Causes for poor conditions of agricultural labour – Problem of Unemployment and Under - employment – Government measures.

**UNIT –VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Recent Developments in Agricultural Economics

**REFERENCES:**

1. Memoria, C.B., & Badri Bishal Tripathi (2003), Agricultural Problems of India, Kitab Mahal Agencies, Patna.
2. Sankaran, S.(2010), Indian Economy, Margham Publications, Chennai.
3. Deepashree, (2011), Indian Economy, Ane Books Pvt Ltd, New Delhi.
4. Sethuraman, K. (2000), Agricultural Marketing, Margham Publications, Chennai

**COURSE OUTCOMES:**

- **CO1:** Find the role of agriculture in Indian Economy, causes for low productivity and measures to improve productivity.
- **CO2:** Demonstrate the structural and institutional changes in agriculture.
- **CO3:** Identify the sources of agricultural finance.
- **CO4:** Analyze the recent state of agricultural marketing and price policy.
- **CO5:** Explain the Government measures for unemployment and agricultural labourers.

**MAPPING**

**CO -PO matrices of course**

1. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	2	3	2
<b>CO2</b>	2	3	3	3	2
<b>CO3</b>	2	3	3	3	3
<b>CO4</b>	2	3	3	3	2
<b>CO5</b>	2	3	3	3	3
<b>Optimum point</b>	2	3	3	3	2

**Third Year**

**CORE COURSE-XIV  
HUMAN RESOURCE MANAGEMENT  
(Theory)**

**Semester-VI**

**Code:22ACCEC14**

**Credits: 5**

**OBJECTIVES:**

- Understand the concept of Human capital.
- Study the methods of Human capital formation
- Acquire knowledge about Human resource planning.
- Examine the various gender issues.
- Gain knowledge about the human development index in India.
- Give an idea about the recent developments in Human Resource Management.

**UNIT –I APPROACHES TO HUMAN CAPITAL:**

Evolution of the Concept of Human Capital- Meaning- Nature  
– Significance – Schultz’s Approach- Becker’s Theory.

**UNIT –II METHODS OF HUMAN CAPITAL FORMATION:**

Education and Economic Growth- Health and Nutrition – Information  
about Job Market – Elimination of Social Discrimination- Brain Drain  
Development Indicators.

**UNIT –III HUMAN RESOURCE PLANNING:**

Meaning-OBJECTIVES- Need-Process- Benefits- Problems.

**UNIT –IV GENDER ISSUES:**

Role of Women in Economic Development - Gender and Inequality –  
Gender Disparities in Education, Occupation and Earnings -  
Development of Women Entrepreneurship in India.

**UNIT –V POPULATION AND DEVELOPMENT:**

Work Participation Rate – Male & Female Work Participation Rate –  
Decadal Variations – Human Development Index in India.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment  
Only) :**

Recent Developments in Human Resource Management

**REFERENCES :**

1. Memoria, C.B., Gankar S.V.(2001), Personnel Management,  
Text& Cases. Himalaya Publishing House, Mumbai.

2. Mira,S.& Saiyandain(2009), Human Resources Management, McGraw –Hill Education Pvt Ltd, New Delhi.
3. Gupta, C.B.(2013), Human Resource Management, Sultan Chand & Sons, New Delhi.
4. Jaysankar,J.(2013), Human Resource Management, Margham Publications, Chennai.
5. Aswathappa,K. ( 2009), Human Resource Management, Tata McGraw –Hill Publishing Company Ltd, New Delhi.
6. Ruddar Datt,K.P.M. Sundharam. (2004), Indian Economy, Shultan Chand & Company Ltd, New Delhi.

**COURSE OUTCOMES:**

- **CO1:** Find evolution, nature and significance of human capital.
- **CO2:** Demonstrate the methods of human capital for economic growth and elimination of social discrimination.
- **CO3:** Identify the OBJECTIVES, need and problems in planning.
- **CO4:** Examine the role of women in economic development.
- **CO5:** Understand the recent developments in Human Resource Management.

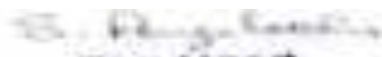
**MAPPING**

**CO -PO matrices of course**

2. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	3	2	2	2
<b>CO2</b>	2	3	2	2	2
<b>CO3</b>	3	2	3	3	3
<b>CO4</b>	2	3	2	2	2
<b>CO5</b>	3	3	3	3	3
<b>Optimum point</b>	2	3	2	2	2

  
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**Third Year**

**CORE COURSE-XV  
ENVIRONMENTAL ECONOMICS  
(Theory)**

**Semester-VI**

**Code:22ACCEC15**

**Credits: 5**

**OBJECTIVES:**

- Study the concept and theories of Environmental Economics.
- Gain knowledge about the welfare economics.
- Acquire knowledge about the environmental issues and laws.
- Understand the Cost benefit analysis.
- Examine the measures of pollution control.
- Provide an overview about the recent developments in Environmental Economics.

**UNIT –I DEFINITION AND SCOPE OF ENVIRONMENTAL ECONOMICS:**

Definition and Scope of Environmental Economics –Concepts and other Theories – Relationship with other sciences – Problems in Pollution – Approaches in Environmental Economics- Environment and Economics - Natural Resources- Conservation of Natural Resources – Green House Effect – Ozone Depletion- Acid Rain- Tragedy of Commons.

**UNIT –II WELFARE ECONOMICS AND ENVIRONMENTAL ECONOMICS:**

Welfare Economics and Environmental Economics – Pareto Theory – Other effects- Environment quality as public good- Optimum Theory – Private and Social cost- Problem of Second cost- Population Menace and Degradation of Environment quality – Urbanisation- Land Use – Air and Water pollution- Noise Pollution.

**UNIT –III ECONOMIC DEVELOPMENT AND QUALITY OF ENVIRONMENT:**

Economic Development and Quality of Environment- Environmental Issues in Developed and Developing Countries – Uses of Resources – Environmental Protection Laws- Environmental Education in Curriculum.

**UNIT –IV COST BENEFIT ANALYSIS:**

Cost Benefit Analysis – Environmental cost of Economic growth – Limits to growth – Pollution cost distribution- Effects- Plans – Total and Marginal Benefits of Pollution Control Efficiency in Pollution- Pollution Control Boards.

## UNIT –V MEASURES OF POLLUTION CONTROL:

Measures of Pollution Control – Fiscal and Direct control measures – Taxes and Subsidies- Pollution Control Methods – Government Investment Programmes- Pollution Permits- Global Issues in Environmental Quality- Role of Government Voluntary and Consumer organization

- Treaties and Agreements at Global Level.

## UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :

Recent Developments in Environmental Economics

### REFERENCES:

1. Sankaran, S. (2004), Environmental Economics, Margham Publications, Chennai.
2. Karpagam,M.(2001), Environmental Economics, Sterling Publications Pvt Ltd, New Delhi.
3. Ganesamurthy,V.S.(2009), Environmental Economics in India, New Century Publications, New Delhi.
4. Eugene,T.(2004), Environmental Economics, Virnda Publications (P) Ltd, Delhi.
5. Ulagnathan Sankar.(2003), Environmental Economics, Oxford University Press, New Delhi.

### COURSE OUTCOMES :

- **CO1:** Recall the concepts, theories , relationship with other sciences and conservation of natural resources.
- **CO2:** Illustrate the Pareto Theory and environmental quality as a public good.
- **CO3:** Analyze the pollution Cost and benefit of pollution control.
- **CO4:** Explain the role of government and voluntary organizations in pollution control.
- **CO5:** Understand the recent developments in Environmental Economics.

### MAPPING

#### CO -PO matrices of course

3. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2
CO2	3	3	3	2	2
CO3	3	3	3	3	3
CO4	3	3	3	2	2
CO5	3	3	3	3	3
<b>Optimum point</b>	3	3	3	2	2

**Third Year      MAJOR BASED ELECTIVE-II      Semester-VI**  
**Entrepreneurship Development**  
**Code:22AMBEEC3      (Theory)      Credits: 5**

**OBJECTIVES:**

- To provide thorough conceptual knowledge about the scope of Entrepreneurship.
- To provide an understanding about the significance of MSMEs and the challenges faced by them.
- To provide an overview of the various promotional agencies and programmes in India for Entrepreneurship development.
- To imbibe an understanding about the Cost estimation and pricing methods for entrepreneurs.
- To train students regarding project preparation and planning with regard to entrepreneurship activities.
- To explore the recent developments in studies regarding Entrepreneurship Development.

**UNIT- I      DEFINITION AND SCOPE OF ENTREPRENEURSHIP:**

Definition- Scope –Significance of Entrepreneurship- Functions of an Entrepreneur – Characteristics- Types- Theories of Entrepreneurship.

**UNIT - II MICRO, SMALL, MEDIUM AND LARGE SCALE INDUSTRIES:**

Micro, Small, Medium and Large Scale Industries and their Significance –Problems – Industrial Policy on Small Scale Industries- Women Entrepreneurship – Concept – Growth- Problems- Prospects and Development Scheme – SHGs and Micro Finance.

**UNIT -III PROMOTIONAL AGENCIES:**

Promotional Agencies – NSIC, TIIC, SIDCO, SIPCOT, District Industrial Centres- Industrial Estates – Industrial Service Institute - Recent Development Schemes in India

**UNIT -IV COST AND PRICE:**

Cost and Price – Methods of Cost Estimation – Cost Control- Pricing Methods –Price Policy- Full Cost Pricing- Legislative Control over prices- Packed Commodities Regulation Act.

**UNIT -V PROJECT PREPARATION AND EVALUATION:**

Project Preparation and Evaluation- Break Even Analysis: Concept- Features- Assumptions- Graphical Analysis – Importance and Limitations.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Recent Developments in studies regarding Entrepreneurship Development

**REFERENCES:**

1. Sangram Keshari Mohanty(2006), Fundamentals of Entrepreneurship, Prentice, Hall of India Pvt Ltd, New Delhi.
2. Khanaka, S.S. (2009), Entrepreneurial Development, Sultan Chand & Sons –New Delhi.
3. Jayshree Suresh, (2013), Entrepreneurial Development, Margham Publications, New Delhi.
4. Vasanthagopal, R. & Santha, S. (2008), Women Entrepreneurship in India, New Century Publications, New Delhi.
5. Dr. C.B.Gupta & Dr. N.P.Srinivasan (2010), Entrepreneurial Development in India, Sultan Chand & Sons, New Delhi.
6. Bose, S.(2013), Self- Help Groups and Rural Development, MJP Publishers, Chennai.

**COURSE OUTCOMES:**

- **CO1:** Asses the opportunities of entrepreneurship in India.
- **CO12** Outline the significance of MSME’S, women entrepreneurship.
- **CO3:** Get a basic idea about the various promotional agencies.
- **CO4:** Synthesize the policy regulations and estimations of cost and price.
- **CO5:** Calculate and frame project proposals.

**MAPPING**

**CO -PO matrices of course**

4. Slight (low) 2, Moderate (medium)3. Substantial (High)

If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	3	2	3	2
<b>CO2</b>	2	3	2	2	2
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	2	3	2	2	2
<b>CO5</b>	3	3	3	3	3
<b>Optimum point</b>	2	3	2	3	2

*[Faint signature and stamp of the institution]*

**Third Year**

**MAJOR BASED ELECTIVE-II Semester-VI  
2.ECONOMICS OF INSURANCE**

**Code:22AMBEEC4**

**(Theory)**

**Credits: 5**

**OBJECTIVES:**

- To give a fairly comprehensive view of the insurance to the undergraduate students in Economics.
- To familiarize the students with the latest development of insurance in India.
- To provide knowledge of the prospects of insurance and the possibilities of managing the insurance sector.
- To give knowledge about the legal dimensions of insurance in India.
- To understand the importance of Insurance in Indian context.
- To explore the contemporary developments in Economics of Insurance.

**UNIT –I INTRODUCTION TO INSURANCE:**

Meaning and Definition of Insurance- Features of Insurance - Functions of insurance – Types of Insurance –Fundamental Principles of Insurance-Importance of Insurance - Profile of Insurance Companies in India – General Insurance - Classification of General Insurance - Insurance and Economic Development.

**UNIT -II LIFE INSURANCE AND HEALTH INSURANCE:**

Meaning and Definition of Life insurance and Health Insurance-Types of Health Insurance Policies – Health Insurance schemes in India - Features of Life Insurance – Advantages of Life Insurance-Fundamental Principles of Life Insurance-Procedure for effecting Life Insurance –Plans of Life Insurance -Individual plans - Group Insurance plans-Pension plans- Premium and its computation - Valuation and Distribution of surplus.

**UNIT -III INTRODUCTION TO RISK MANAGEMENT:**

Definition of Risk – Selection of Risk or Underwriting of Risk - Classification of risk - Tools of the Risk - Risk Management Process-Determination of OBJECTIVES - Identifying Risk exposures - Evaluating Risks - Consideration of Alternatives and Selection of the Risk Treatment Device.

**UNIT -IV LEGAL DIMENSIONS OF INSURANCE AND GROWTH OF INSURANCE BUSINESS IN INDIA:**

Introduction- The Insurance Act, 1938 – Life Insurance Corporation Act, 1956 – General Insurance Business (Nationalisation) Act,1972 – Consumer Protection Act,1986 –Insurance Regulation and Development Authority(IRDA) - Growth of General Insurance after Nationalisation -Issues concerning Growth of Insurance - Future Potential.

**UNIT -V INSURANCE MARKETING:**

Introduction - Concept of Insurance Market - Concept of Insurance Marketing- Marketing Strategies of Insurance Companies - Benefits of Bank Assurance – Benefits of Bank Assurance – Steps in Personal Selling or Selling Process.

**UNIT -VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Contemporary developments in Economics of Insurance

**REFERENCES**

1. Periyasamy, P. (2005), Principles and Practice of Insurance, Himalaya Publishing House, Mumbai.
2. Bodla, B.S., Garg,M.C.and Singh K.R. (2004), Insurance, Fundamentals, Environment, Procedures , Deep and Deep Publications Pvt Limited, New Delhi.
3. Muthy,A (2006), Elements of Insurance, Margham Publications,Chennai.
4. Jyotsna Sethi and Nishwan Bhatia, (2008), Elements of Banking and Insurance, PHI Learning Pvt Limited, New Delhi.
5. Kanika Mishra, (2010), Fundamental of Life Insurance Theories and Applications, PHI Learning Pvt Limited, New Delhi.
6. Emmett J.Vaughan and Therese Vaughan, (2007), Fundamentals of Risk and Insurance, Pasupathi Printers P.Ltd, New Delhi.
7. Dharmaraj,E. (2009), Elements of Insurance, SIMRES Publishers, Chennai.
8. Madhukar Pawar, R. (2012), Fundamentals of Insurance, Chandralok Prakashan, Kanpur.

**COURSE OUTCOMES:**

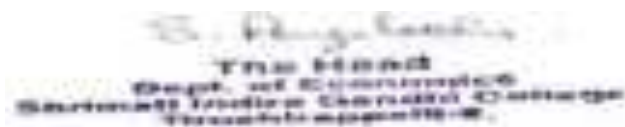
- **CO1:** Recall the meaning, nature and importance of insurance.
- **CO2:** Understand the meaning of risk and its management.
- **CO3:** Discuss the features of life and health insurance.
- **CO4:** Trace the growth of insurance business in India.
- **CO5:** Analyze the strategies of insurance marketing.

**MAPPING**

**CO -PO matrices of course**

5. Slight (low) 2, Moderate (medium)3. Substantial (High)  
If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	3	2	3
<b>CO2</b>	2	2	2	2	2
<b>CO3</b>	2	2	3	3	3
<b>CO4</b>	2	2	2	2	2
<b>CO5</b>	2	2	3	3	3
<b>Optimum point</b>	2	2	3	2	3



**Third Year**

**SKILL BASED ECLECTIVE - II  
HEALTH ECONOMICS**

**Semester-VI**

**Code:22ASBEEC2**

**(Theory)**

**Credits: 2**

**OBJECTIVES:**

- To assess the interlinks between health and economic development.
- To enable the understanding factors that can determine health.
- To elucidate the importance of various types of Health Policies.
- To enable understanding of the Microeconomic view of Demand and supply in health care markets.
- To cultivate the ability to understand health and economic status in developing countries.
- To understand the various contemporary developments in Health Economics.

**UNIT –I HEALTH ECONOMICS – BASIC CONCEPTS:**

Definition and Dimensions of Health (WTO Definition) Meaning and importance of Health Economics – Determinants of Health – input and output indicators of Health

**UNIT – II HEALTH AND DEVELOPMENT :**

Income and Health linkages – Concept of Well-being – PQLI and HDI – Poverty and health – Occupational Health Hazards – Fertility – Morbidity – Mortality and Life Expectancy Nutrition and Health – Malnutrition – Under Nutrition

**UNIT – III HEALTH INVESTMENT, HEALTH PLANNING AND POLICY:**

Economics of Public Health – Education and Health – Concept of Health Education – Capital Formation in Health care – Health Planning – Need – Approaches Planning cycle; Health Policy – Dimensions – Need.

**UNIT – IV MICRO ECONOMICS OF HEALTH SERVICES :**

Demand for health services – Preference for Health and Healthcare – Income and Price effects – Physician as a price discriminating monopolist – Health Production Function with illustration

**UNIT – V HEALTH IN DEVELOPING COUNTRIES:**

Significance of Health in LDCs – Measuring the Burden of Disease – The concepts DALY and QALYs – Challenges for the future

**UNIT- VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Contemporary developments in Health Economics

**REFERENCE:**

1. Alistair Mc Guire, John Henderson and Gavin Mooney (1998), The Economics of Health Care: An Introductory Text. (Routledge and Kegan Paul London and New York. PP 9-30)
2. Asha A. Bhende and Tara Kanitkar (2001), Principles of Population Studies (Himalaya Publishing House, New Delhi).
3. Park. K, (2000) Park's Text Book of Preventive and Social Medicine. 16<sup>th</sup> edition. (M/S. BanarsidasBhanot Publishers, Jalalpur).
4. William Jack (1999), Principals of Health Economics for Developing Countries, WBI Development Studies (The World Bank, Washington. D.C.)
5. Government of India (1983), National Health Policy, New Delhi.
6. Indian Council of Social Science, Research and Indian Council of Medical Research (1981), Health for All 2002 A.D. (ISSR, Delhi).

**COURSE OUTCOMES:**

- **CO1:** Make students understand the interlink between health and economics.
- **CO2:** Make students understand the concept of wellbeing PQLI and HDI.
- **CO3:** Make students understand the micro level of health services.
- **CO4:** Make students gain knowledge about health policies and planning.
- **CO5:** Make students gain knowledge about Contemporary developments in Health Economics.

**MAPPING****CO -PO matrices of course**

6. Slight (low) 2, Moderate (medium)3. Substantial (High)  
If there is no correlation, put

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	3	2	2	3
<b>CO2</b>	2	3	3	2	2
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	2	3	3	2	2
<b>CO5</b>	3	3	3	3	3
<b>Optimum point</b>	2	3	3	2	3





# SHRIMATI INDIRA GANDHI COLLEGE

Nationally Accredited at 'A' Grade (3<sup>rd</sup> Cycle) by NAAC

An ISO 9001 : 2015 Certified Institution

Tiruchirappalli - 630 003

## **B.Sc - Computer Science / BCA / B.Sc – Information Technology**

### **PROGRAMME OUTCOMES:**

**PO1:** Graduates will be able to comprehend the basic concepts learnt and apply in real life situations with analytical skills.

**PO2:** Graduates with acquired skills and enhanced knowledge will be employable become entrepreneurs or will pursue higher Education.

**PO3:** With acquired knowledge of modern software tools will be able to contribute effectively as software engineers.

**PO4:** Graduates will be able to comprehend the related concepts to Computer Science with Allied papers

**PO5:** Graduates will be imbued with ethical values and social concerns to ensure peaceful society

**CORE COURSE – I**  
**PROGRAMMING IN C AND DATA STRUCTURE**  
**(22SCCCS1 / 22SCC CA1/ 22SCCIT1)**

**UNIT-I:**

Basic of C: History of C and its importance – Structure of a C program–Data Types–Constants and Variables–operators and Expressions–Order of Precedence, Evaluating of Arithmetic Expressions–Type Conversion- Decision Statements:if, if-else,and nested if statements

**UNIT-II:**

Loops Structures: For Loop, While, Do- while loop–Arrays:- One Dimensional Array,Two dimensional Arrays, Character Arrays and Strings – Functions: Function with arrays - Function with decision and looping statements - Recursion.

**UNIT- III:**

Pointers: Introduction –Pointer Expressions –Chain of Pointers – Pointers and Arrays– Array of Pointers – Pointers as function arguments–Functions returning Pointers– Pointers to Functions– Function pointer–Structures- declaration, initialization, Array of Structures – Pointer to structures, Structures and functions – Typed of Enumerated data types, Unions.

**UNIT-IV:**

Strings Processing, Standard string library functions– Files:introduction and files functions–writing and reading in Textmode– Simple application: Display the contents of a file. Write data to a file. Append data to an existing file–File IO–Reading and writing structures.

**UNIT-VI:**

**CURRENT CONTOURS (For continuous internal assessment only)**

Contemporary Developments Related to the Course during the Semester Concerned.

## REFERENCES:

1. E.Balagurusamy, “Programming in ANSI C”, Tata McGraw Hill, NewDelhi, Seventh Edition,2016.
2. E.Horowitz, Sahni and Susan Anderson Freed , “Fundamental Data Structures in C”, 2ed, Orient Black Swan Publisher, 2009.
3. Byron S Gottfried ,“Programming with C”, Schaum’s Outline Series, Tata - McGraw Hill Edition, NewDelhi,1991.
4. E. Karthikeyan, “A Textbook on C Fundamentals, Data Structures and Problem Solving”, Prentice- Hall of India Private Limited, New Delhi, 2008.
5. Yashavant Kanetkar, “Let us C”, BPB Publications, Tenth Edition, New Delhi, 2010.
6. Szuhay, Jeff and Szuhay, Jeff, “Learn C Programming:A Beginner's Guide To Learning C Programming the Easy and Disciplined Way”, Packt Publishing, 2020.
7. Jena, SisirKumar, and Jena, Sisir Kumar,“C Programming:Learn to Code”, CRC Press,2021.
8. <https://www.tutorialspoint.com/cprogramming/index.htm>
9. <https://www.w3schools.in/data-structures/intro>

## COURSE OUTCOMES:

CO1:Summarize the basic knowledge to develop C programs

CO2:Manipulate Looping, arrays and functions

CO3:Apply and write programs for solving real world problems

CO4:Create,open,read,manipulate,write and close files.

CO5:Understand the basic concepts in data structures.

## MAPPING

### CO - PO – PSO matrices of course

1: Slight (Low)    2: Moderate (Medium)    3: Substantial (High)

If there is no correlation, put “-“

### CORE COURSE – I

### PROGRAMMING IN C AND DATA STRUCTURE

**(22SCCCS1/ 22SCCCA1/ 22SCCIT1)**

PO CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCCS1:1/ 22SCCCA1:1/ 22SCCIT1:1</b>	3	3	3	3	3
<b>22SCCCS1:2/ 22SCCCA1:2/ 22SCCIT1:2</b>	3	3	3	3	3
<b>22SCCCS1:3/ 22SCCCA1:2/ 22SCCIT1:3</b>	3	3	3	3	3
<b>22SCCCS1:4/ 22SCCCA1:3/ 22SCCIT1:4</b>	3	3	3	3	3
<b>22SCCCS1:5/ 22SCCCA1:3/ 22SCCIT1:5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3



**CORE PRACTICAL-I**  
**PROGRAMMING IN C LAB**  
**(22SCCCS1P/22SCCCA1P/22SCCIT1P)**

**FIRST YEAR**

**SEMESTER :I**

1. Write a Program
  - (i) To convert temperature from degree Centigrade to Fahrenheit,
  - (ii) Find whether given number is Even or Odd,
  - (iii) Find the greatest of Three numbers.
2. Write a Program to display Monday to Sunday using switch statement
3. Write a Program to display first Ten Natural Numbers And their sum.
4. Write a Program to perform Multiplication of Two Matrices.
5. Write a Program
  - (i) To find the maximum number in an Array using pointer.
  - (ii) To reverse a number using pointer.
  - (iii) To add two numbers using pointer.
6. Write a Program to solve Quadratic Equation using functions.
7. Write a Program to find factorial of a number using Recursion.
8. Write a Program to demonstrate Call by Value and Call by Reference.
9. Write a Program to create a file containing Student Details.
10. Write a program to implement a stack using singly linked list, Implement Queue using Linked List.

**COURSE OUTCOMES:**

**CO1:** Relate the use of language constructs to solve simple programs.

**CO2:** Develop programs for various concepts in C Language

**CO3:** Understand and trace the execution of the list of programs

**CO4:** Understand the usage of file handling in C programming

**CO5:** Solve data problems related to data structures.

## CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High) If there is no correlation, put “-“

### **CORE PRACTICAL – I PROGRAMMING IN C LAB (22SCCCS1P/22SCCCA1P/22SCCIT1P)**

PO /CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCCS1P/ 22SCCCA1P:1/ 22SCCIT1P:1</b>	3	3	3	3	3
<b>22SCCCS1P:2/ 22SCCCA1P:2/ 22SCCIT1P:2</b>	3	3	3	3	3
<b>22SCCCS1P:3/ 22SCCCA1P: 3/ 22SCCIT1P:3</b>	3	3	3	3	3
<b>22SCCC S1P:4/ 22SCCCA1P:4/ 22SCCIT1P:4</b>	3	3	3	3	3
<b>22SCCCS1P:5/ 22SCCCA1P:5/ 22SCCIT1P:5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3

**CORE COURSE-II**  
**PROGRAMMING IN JAVA**  
**(22SCCCS2/ 22SCCCA2/ 22SCCIT2)**

**FIRST YEAR**

**SEMESTER :II**

**UNIT-I:**

Foundation, Essentials, Control Statement and Classes & Objects, Stage of Java—origin of Java – challenges - features Object-Oriented Programming; JavaEssentials: Elements - API - variables- primitive data types– String Class - operators—combined assignment operators- conversion – scope – comments- keyboard input; Control Statements: if, if-else, nested if & if-else- if statements – logical operators—comparison—conditional operator– switch– increment and decrement – while, do-while & for loops – nested loops break and continue; Classes and Objects: classes and objects - modifiers - passing arguments – constructors -package & import-static class members– method overloading – constructor overloading– returning objects—this variable–recursion–nested & inner classes–abstract classes & methods.

**UNIT-II:**

Arrays, String Handling, Inheritance, Interface and Packages, Introduction—processing array—passing arrays—returning arrays—String arrays– two Dimensional Arrays - Arrays with Three or More Dimensions; StringHandling:Stringclass –concatenation– comparison – substring– methods– other methods–String Buffer, String Builder & String Tokenizer classes;Inheritance: basics—inheritingand overriding super class methods– calling super class constructor–polymorphism– inherit from different classes – abstract classes – final Class; Interfaces: Basics – multiple Interfaces—multiple inheritance using interface– multilevel interface– Packages – Create and access packages in NetBeans IDE–static Import and package class – access specifiers.

**UNIT-III:**

Exception Handling ,I/O and File Handling and Multithreading ,Introduction – try and catch block - multiple catch block - nested try - finally Block –throw Statement – exception propagation – throw Clause - custom exception – built-in exception; Multithreading: Introduction – threads – thread creation – life cycle – joining a thread – scheduler & priority – synchronization– inter-thread communication–thread control– thread Pool – thread group–daemon thread;Files and I\O Streams:file Class–streams– byte streams–filtered byte streams–Randomaccessfile Class– character streams.

## **UNIT-IV:**

Applet and GUI PartI, Fundamentals–applet class life cycle–steps for applet program–passing values through parameters–graphics event handling GUI: GUI–creating windows–dialog boxes layout managers–AWT component classes–Swing component classes– applications of AWTcontrols.

## **UNIT-V:**

GUI Part II and Java Database Connectivity, Event handling– AWT components – AWT graphics classes – Swing controls – application using Swing and AWT; Java Database Connectivity: types of drivers – JDBC architecture – JDBC classes & interfaces–steps in JDBC applications– creating a new Database and Table With JDBC.

## **UNIT-VI**

### **CURRENT CONTOURS (For Continuous internal assessment only)**

Contemporary Developments Related to the Course during the semester Concerned.



## REFERENCES:

1. S. Sagayaraj, R. Denis, P. Karthik & D. Gajalakshmi, Constructive Java Programming“, Universities Press , 2021.
2. E.Balagurusamy, “Programming with JAVA” ,Tata McGraw Hill, New Delhi 2019.
3. C.Muthu, “Programming with JAVA”, Vijay Nicole Imprints Private Limited, Chennai, Second Edition,2011.
4. Bruce Eckel, Chuck Allison, “Thinking in Java”, Prentice Hal IPublications, 2006
5. Malina Pronto "Java: How To Learn Java Programming :How To Improve Your Java Coding In 2020/2021: 5 Programming Languages To Learn For Beginners In Tech", Independently Published, 2020.
6. Nik Samoylov, “Learn Java 12 Programming: A Step-by-step Guide to Learning Essential Concepts in Java”, Packt Publishing, 2019.
7. <https://www.javatpoint.com/java-tutorial>

## COURSE OUTCOMES:

**CO1:** Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.

**CO2:** Identify members of a class and to implement them.

**CO3:** Create Java application programs using sound OOP practices (e.g., interface and APIs) and proper program structuring (e.g., by using access control identifiers, and create user defined packages for specific tasks, (reusability concepts) error exception handling)

**CO4:** Develop programs using the Java standard class library.

**CO5:** Develop software using Java programming language, (Using applet, AWT controls, and JDBC).

## CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

### **CORE COURSE – II -**

### **PROGRAMMING IN JAVA -**

**(22SCCCS2/22SCCCA2/22SCCIT2)**

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
<b>22SCCCS2:1/ 22SCCCA2:1/ 22SCCIT2:1</b>	3	3	3	3
<b>22SCCCS2:2/ 22SCCCA2:2/ 22SCCIT2:2</b>	3	3	3	3
<b>22SCCCS2:3/ 22SCCCA2:3/ 22SCCIT2:3</b>	3	3	3	3
<b>22SCCCS2:4/ 22SCCCA2:4/ 22SCCIT2:4</b>	3	3	3	3
<b>22SCCCS2:5/ 22SCCCA2:5/ 22SCCIT2:5</b>	3	3	3	3
<b>Average</b>	3	3	3	3



**CORE PRACTICAL - II**  
**PROGRAMMING IN JAVA LAB**  
**(22SCCCS2P/22SCCCA2P/22SCCIT2P)**

**FIRST YEAR**

**SEMESTER : II**

1. Write a program to sort the given numbers using arrays.
2. Write a program to implement the FIND and REPLACE operations in the given text.
3. Write a program to implement a calculator to perform basic arithmetic Operations, doing with constructors
4. Write a program to find the student's percentage and grade using command line arguments.
5. Implement multiple inheritance concepts in java using interface , you can choose your own example of a company or education institution or a general concept which requires the use of interface to solve a particular problem.
6. Write a program to create threads and perform operations like start, stop, suspend, resume
7. Write a program to develop an applet to play multiple audio clips using multithreading.
8. Write a program to retrieve employee data from a file
9. Write a program to retrieve student data from a Database

**COURSE OUTCOMES**

**CO1:** Develop java programs to understand the OOP concepts

**CO2:** Write java programs for classes and objects

**CO3:** Develop simple programs with multiple threads

**CO4:** Write java programs using Applets

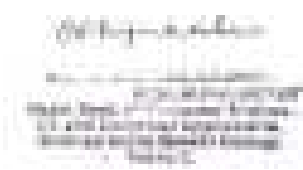
**CO5:** Develop java programs to connect databases and files.

**CO - PO – PSO matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

**CORE PRACTICAL – II: PROGRAMMING IN JAVA LAB -  
(22SCCCS2P/22SCCCA2P/22SCCIT2P)**

<b>CO \ PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>22SCCC S2P:1/ 22SCCCA2P:1/ 22SCCI T2P:1</b>	3	3	3	3	3
<b>22SCCC S2P:2/ 22SCCCA2P:2/ 22SCCI T2P:2</b>	3	3	3	3	3
<b>22SCCC S2P3/ 22SCCCA2P:3/ 22SCCI T2P:3</b>	3	3	3	3	3
<b>22SCCC S2P:4/ 22SCCCA2P:4/ 22SCCI T2P:4</b>	3	3	3	3	3
<b>22SCCCS2P:5/ 22SCCCA2P:5/ 22SCCI T2P:5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3



# SYLLABUS

## COURSE III: PROGRAMMING IN PYTHON (22SCCCS3)

**UNIT - I:** Introduction to Python: Features of Python - How to Run Python - Identifiers - Reserved Keywords - Variables - Comments in Python - Indentation in Python - Multi-Line Statements - Multiple Statement Group (Suite) - Quotes in Python - Input, Output and Import Functions - Operators. Data Types and Operations: Numbers – Strings – List – Tuple – Set – Dictionary – Data type conversion.

**UNIT - II:** Flow Control: Decision Making – Loops – Nested Loops – Types of Loops. Functions: Function Definition – Function Calling - Function Arguments - Recursive Functions - Function with more than one return value.

**Unit - III:** Modules and Packages: Built-in Modules - Creating Modules - import Statement - Locating Modules - Namespaces and Scope - The dir() function - The reload() function - Packages in Python - Date and Time Modules. File Handling- Directories in Python.

**UNIT - IV:** Object-Oriented Programming: Class Definition - Creating Objects - Built-in Attribute Methods - Built-in Class Attributes- Destructors in Python – Encapsulation - Data Hiding – Inheritance - Method Overriding- Polymorphism.

**UNIT - V:** Exception Handling: Built-in Exceptions-Handling ExceptionsException with Arguments - Raising Exception - User-defined Exception - Assertions in Python. Regular Expressions: The match() function - The search() function - Search and Replace - Regular Expression Modifiers: Option Flags-Regular Expression PatternsCharacter Classes-Special Character Classes - Repetition Cases - findall() method - compile() method.

**UNIT – VI CURRENT CONTOURS** (For continuous internal assessment only): An Introduction to Interactive Programming in Python - Study on Julia – an high level language approach.

## **REFERENCES:**

1. Jeeva Jose and P. Sojan Lal, “Introduction to Computing and Problem Solving with PYTHON”, Khanna Book Publishing Co, 2016.
2. Mark Summerfield. — Programming in Python 3: A Complete introduction to the Python Language, Addison-Wesley Professional, 2009.
3. Martin C. Brown, —PYTHON: The Complete Reference||, McGrawHill, 2001
4. Wesley J. Chun, “Core Python Programming”, Prentice Hall Publication, 2006.
5. Timothy A Budd, “Exploring Python”, Tata McGraw Hill, New Delhi, 2011
6. Jake Vander Plas, “Python Data Science Handbook: Essential Tools for Working with Data”, O'Reilly Media, 2016.
7. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist, 2nd edition, Updated for Python 3, Shroff/O Reilly Publishers, 2016
8. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

## **Course Outcomes (CO)**


- CO1:** To recall and understand the features of python programming language
- CO2:** To illustrate various programming mechanism used in python
- CO3:** To apply various language construct to write simple programs in python
- CO4:** To examine the application of object oriented concept in python
- CO5:** To distinguish the various constructs used in python.

# MAPPING

## CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22SCCCS3.1	3	2	-	-	3
22SCCCS3.2	3	2	-	2	3
22SCCCS3.3	3	3	-	3	3
22SCCCS3.4	3	3	-	3	2
22SCCCS3.5	3	3	1	1	3
<b>Average</b>	3	2.6	1	1.8	2.8

  
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**SYLLABUS**  
**COURSE III (CP): PROGRAMMING IN PYTHON LAB**  
**(22SCCCS3P)**

1. Flow controls, Functions and String Manipulation
2. Operations on Tuples and Lists
3. Operation on sets
4. Operations on Dictionary
5. Simple OOP– Constructors – create a class for representing a car
6. Method Overloading – create classes for vehicle and Bus and demonstrate method overloading
7. Files – Reading and Writing – perform the basic operation of reading and writing with student file
8. Regular Expressions
9. Modules
10. Packages
11. Exception Handling

**Course Outcomes (CO)**

- CO1 : Write simple programs using control structures, functions and strings
- CO2 : Develop programs using tuples, lists, sets and dictionary
- CO3 : Write simple programs using Constructors, Method overloading and inheritance
- CO4 : Develop programs using files and regular expressions
- CO5 : Write simple programs using packages and exception handling



# MAPPING

## CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

### **COURSE III (CP): PROGRAMMING IN PYTHON LAB (22SCCCS3P)**

PO CO	PO1	PO2	PO3	PO4	PO5
22SCCCS3P: 1	3	2	3	3	3
22SCCCS3P: 2	3	3	2	2	3
22SCCCS3P:3	1	2	3	3	3
22SCCCS3P:4	3	2	3	3	2
22SCCCS3P:5	3	3	3	3	1
Average	3	2	3	3	2

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& Technology

## **SYLLABUS**

### **COURSE III: DATABASE MANAGEMENT SYSTEM (22SCCCS4/22SCCCA4)**

#### **UNIT - I:**

Introduction: Database-System Applications- Purpose of Database Systems - View of Data -Database Languages - Relational Databases - Database Design -Data Storage and Querying Transaction Management -Data Mining and Analysis - Database Architecture - Database Users and Administrators - History of Database Systems.

#### **UNIT - II:**

Relational Model: Structure of Relational Databases -Database Schema - Keys – Schema Diagrams - Relational Query Languages - Relational Operations Fundamental Relational-Algebra Operations Additional Relational-Algebra Operations- Extended Relational-Algebra Operations - Null Values - Modification of the Database.

#### **UNIT - III:**

SQL Overview of the SQL Query - Language - SQL Data Definition - Basic Structure of SQL Queries - Additional Basic Operations - Set Operations - Null Values Aggregate Functions - Nested Subqueries - Modification of the Database - Join Expressions - Views - Transactions - Integrity Constraints - SQL Data Types and Schemas – Authorization.

#### **UNIT - IV:**

Relational Languages: The Tuple Relational Calculus - The Domain Relational Calculus Database Design and the E-R Model: Overview of the Design Process - The Entity-Relationship Model - Reduction to Relational Schemas - EntityRelationship Design Issues - Extended E-R Features - Alternative Notations for Modeling Data - Other Aspects of Database Design

#### **UNIT - V:**

Relational Database Design: Features of Good Relational Designs - Atomic Domains and First Normal Form - Decomposition Using Functional Dependencies - Functional - Dependency Theory - Decomposition Using Functional Dependencies - Decomposition Using Multivalued Dependencies - More Normal Forms - Database-Design Process 18

#### **UNIT - VI:**

CURRENT CONTOURS (for Continuous Internal Assessment Only): Contemporary Developments Related to the Course during the Semester Concerned.

## **REFERENCES:**

1. Database System Concepts, Sixth edition, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill-2010.
2. Jagdish Chandra Patni, Hitesh Kumar Sharma, Ravi Tomar, Avita Katal., "Database Management System: An Evolutionary Approach", CRC Press, 2022.
3. Abraham Silberschatz, Hendry F. Korth, S Sudharshan," Database System Concepts", 6th Edition, McGraw Hill International, 2019.
4. Blokdyk, Gerardus, and Blokdyk, Gerardus, "RDBMS Relational Database Management System a Complete Guide", 2020 Edition, Emereo Pty Limited, 2019.
5. Wilfried Lemahieu, Seppevanden Broucke, Bart Baesens, "Principles of Database Management: The Practical Guide to Storing, Managing and Analyzing Big and Small Data", Cambridge University Press, 2018.
6. C.J. Date, "An Introduction to Database Systems" Addison Wesley, 2000. 7. <https://tutorialspoint.dev/computer-science/dbms>

## **COURSE III: DATABASE MANAGEMENT SYSTEM (22SCCCS4/22SCCCA4)**

### **Course Outcomes (CO)**

- CO1: Understand the basic concepts of Database Systems
- CO2: Know about SQL queries to interact with Database
- CO3: Design a Database using ER Modelling
- CO4: Apply normalization on database design to eliminate anomalies
- CO5: Analyze database transactions and to control them by applying ACID Properties.

## MAPPING

### CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

### **COURSE – III: - DATABASE MANAGEMENT SYSTEMS (22SCCCS4/22SCCCA4)**

PO / CO	PO1	PO2	PO3	PO4	PO5
22SCCCS4.1/ 22SCCCA4.1	3	2	3	2	2
22SCCCS4.2/ 22SCCCA4.2	3	2	1	2	2
22SCCCS4.3/ 22SCCCA4.3	3	2	2	2	2
22SCCCS4.4/ 22SCCCA4.4	3	2	2	3	1
22SCCCS4.5/ 22SCCCS4.5	2	3	3	2	2
Average	3	2	2	2	2

*[Faint, illegible text, possibly a signature or stamp]*

## SYLLABUS

### COURSE III(CP): DATABASE MANAGEMENT SYSTEMS LAB

#### (22SCCCS4P)/ 22SCCCA4P

1. Create a table and perform the following basic MySQL operations a) Set the primary key b) Alter the structure of the table c) Insert values d) Delete values based on constraints e) Display values using various forms of select clause f) Drop the table
2. Develop MySQL queries to implement the following set operations a) Union b) Union all c) Intersect d) Intersect all
3. Develop MySQL queries to implement the following aggregate functions a) Sum b) Count c) Average d) Maximum e) Minimum f) Group by clause & having clause
4. Develop MySQL queries to implement following join operations a) Natural join b) Inner join c) Outer join-left outer, right outer, full outer d) Using join conditions
5. Develop MySQL queries to implement nested sub queries a) Set membership (int, not int) b) Set comparison (some, all) c) Empty relation (exists, not exists) d) Check for existence of Duplicate tuples(unique, not unique)
6. Develop MySQL queries to create a views and expand it.
7. Develop MySQL queries to implement a) String operations using % 20 b) String operations using ‘\_’ c) Sort the element using asc,desc [\*create necessary relations with requires attribute]
8. Consider the following database for a banking enterprise BRANCH(branch-name:string, branch-city:string, assets:real) ACCOUNT(accno:int, branch-name:string, balance:real) DEPOSITOR(customer-name:string, accno:int) CUSTOMER(customer-name:string, customer-street:string, customercity: string) LOAN(loan-number:int, branch-name:string, amount:real) BORROWER(customer-name:string, loan-number:int) i. Create the above tables by properly specifying the primary keys and the foreign keys ii. Enter at least five tuples for each relation iii. Find all the customers who have at least two accounts at the Main branch. iv. Find all the customers who have an account at all the branches located in a specific city. v. Demonstrate how you delete all account tuples at every branch located in a specific city. vi. Generate suitable reports. vii. Create a suitable front end for querying and displaying the results.

**COURSE III(CP): DATABASE MANAGEMENT SYSTEMS LAB  
(22SCCCS4P)/ 22SCCCA4P**

**Course Objectives (CO):**

- CO1:** Write queries to manipulate data.
- CO2:** Demonstrate the aggregate functions and set operations.
- CO3:** Apply the join operations.
- CO4:** Know about usage of nested sub queries.
- CO5:** Understand the method to create views .

**MAPPING**

**CO - PO – PSO matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

**COURSE III(CP): DATABASE MANAGEMENT SYSTEMS LAB  
(22SCCCS4P)/ 22SCCCA4P**

PO CO	PO1	PO2	PO3	PO4	PO5
22SCCCS4P.1/ 22SCCCA4P.1	3	3	2	3	3
22SCCCS4P.2/ 22SCCCA4P.2	3	3	2	2	3
22SCCCS4P.3/ 22SCCCA4P.3	2	2	3	3	2
22SCCCS4P.4/ 22SCCCA4P.4	2	2	3	3	2
22SCCCS4P.5/ 22SCCCA4P.5	3	2	3	3	2
<b>Average</b>	2	2	3	3	3

**CORE COURSE V: FUNDAMENTALS OF ALGORITHMS  
(22SCCCA5)/(22SCCCS5)**

UNIT - I: Introduction – Algorithm Specification, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Performance Measurement, Randomized algorithms.

UNIT - II: Trees – Binary tree representations – Tree Traversal – Threaded Binary Trees – Binary Tree Representation of Trees – Graphs and Representations – Traversals, Connected Components and Spanning Trees – Shortest Paths and Transitive closure – Activity Networks – Topological Sort and Critical Paths..

Unit - III: Algorithms – Priority Queues - Heaps – Heap Sort – Merge Sort – Quick Sort – Binary Search – Finding the Maximum and Minimum.

UNIT - IV: Greedy Method: The General Method – Optimal Storage on Tapes – Knapsack Problem – Job Sequencing with Deadlines – Optimal Merge Patterns.

UNIT - V Back tracking: The General Method – The 8-Queens Problem – Sum of Subsets – Graph Coloring.

**UNIT – VI : CURRENT CONTOURS (for Continuous Internal Assessment Only):**  
Contemporary Developments Related to the Course during the Semester Concerned

## REFERENCES:

1. Ellis Horowitz, Sartaj Sahni, "Fundamentals of Data Structure", Galgotia Publications, 2008.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Computer Algorithms", University Press, 2008.
3. Seymour Lipschutz, "Data Structures", Tata McGraw Hill, Schaum's Outline Series, 2014.
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012. 23
5. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "Data Structures and Algorithms
6. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012.
7. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", MIT Press, 2022.
8. [https://www.tutorialspoint.com/data\\_structures\\_algorithms/algorithms\\_basics.htm](https://www.tutorialspoint.com/data_structures_algorithms/algorithms_basics.htm)
9. [https://www.tutorialspoint.com/design\\_and\\_analysis\\_of\\_algorithms/index.m](https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.m)

## Course Outcomes (CO)

CO1: Know the basic concepts of algorithms

CO2: Understand trees and shortest path algorithms.

CO3: Compare and contrast different sorting algorithms

CO4: Comprehend greedy and optimality algorithms.

CO5: Appreciate the backtracking concept and its different algorithms.

\*\*\*\*\*



# MAPPING


## *CO - PO – PSO matrices of course*

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### **CORE COURSE V: FUNDAMENTALS OF ALGORITHMS (22SCCCA5)/(22SCCCS5)**

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22SCCCA5.1	3	3	2	3	3
22SCCCA5.2	3	3	2	3	3
22SCCCA5.3	3	3	2	3	3
22SCCCA5.4	3	3	2	3	2
22SCCCA5.5	3	3	2	3	3
<b>Average</b>	3	3	2	3	3

  
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**CORE COURSE VI (CC)- Computer Networks  
(22SCCCA6)/(22SCCCS6)**

**UNIT - I:** Data Communication – Networks – The Internet – Protocols and Standards – OSI Model Layers in OSI Model - TCP/IP Protocol Suite – Addressing.

**UNIT - II:** Analog and Digital – Digital Signals – Transmission Impairment – Performance – Multiplexing – Guided Media – Unguided Media. Switching: Circuit Switched Networks – Datagram Networks – Virtual Circuit Networks

**Unit - III:** Data Link Layer: Error Detection and Correction -Introduction – Block Coding: Error detection, Error correction – Data Link Control: Framing – Flow and Error Control – Protocols – Noiseless Channels – Noisy channels – HDLC – Point to Point Protocol..

**UNIT - IV:** Wired LAN: IEEE Standards – Standard Ethernet. Wireless LAN: IEEE 802.11 – Bluetooth. Connecting LANs: Connecting Devices – Virtual LANs. Wireless WAN: Cellular Telephony – Satellite Networks. Network Layer-Logical Addressing: IPv4 Addresses – IPv6 Addresses.

**UNIT - V:** Transport Layer: Process to Process Delivery – User Datagram Protocol - TCP. Application Layer: Domain Name Space – DNS in the Internet – Electronic Mail – File Transfer. WWW: Architecture – HTTP.

**UNIT–VI:** Current Colours (for Continuous Internal Assessment Only): Contemporary Developments Related to the Course during the Semester Concerned.

## REFERENCES:

1. Behrouz A. Forouzan, "Data Communications and Networking", McGraw-Hill Companies, New York, 5th Edition, 2017.
2. William Stallings "Data and computer communications", Prentice Hall of India, 7th Edition, 2004..
3. Andrew S Tanenbaum, "Computer Networks", Prentice Hall of India, New Delhi, 2013.
4. Dr M. P. Vani, "Data Communication and Computer Network", Notion Press, 2019.  
Hazim Gaber, "Understanding Computer Networks 2020", Independently Published, 2020.
5. Grigorios N. Beligiannis, Ram Palanisamy, S. Smys, Álvaro Rocha, "Computer Networks and Inventive Communication Technologies", Springer, 2021.  
<https://www.guru99.com/data-communication-computer-network-tutorial.html>

## Course Outcome (CO)

- CO1:** Build an understanding of the fundamental concepts of computer networking
- CO2:** Independently understand basic computer network technology
- CO3:** Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions engaged in continuing professional development or professional societies in computer networking or a related computing field.
- CO4:** Represent various data encoding and modulation techniques..
- CO5:** Identify the errors using source and coding methods.

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## MAPPING

### CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

### CORE COURSE VI (CC)- Computer Networks (22SCCCA6)/(22SCCCS6)

PO/CO	PO1	PO2	PO3	PO4	PO5
22SCCCA6.1	3	3	2	3	3
22SCCCA6.2	3	3	2	3	3
22SCCCA6.3	3	3	2	3	3
22SCCCA6.4	3	3	2	3	2
22SCCCA6.5	3	3	3	3	3
Average	3	3	2	3	3

  
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**DIGITAL ELECTRONICS AND MICROPROCESSOR (22SCCCS7)****UNIT - I:**

Digital Systems and Binary Numbers - Digital Systems - Binary Numbers - Number Base Conversions - Octal and Hexadecimal Numbers - Complements of Numbers. Signed Binary Numbers - Binary Codes - Binary Storage and Registers - Binary Logic

**UNIT - II:**

Boolean Algebra and Logic Gates - Introduction - Basic Definitions - Axiomatic Definition of Boolean Algebra - Basic Theorems and Properties of Boolean Algebra. Boolean Functions - Canonical and Standard Forms - Other Logic Operations - Digital Logic Gates - Integrated Circuits.

**UNIT - III:**

Combinational Logic - Introduction - Combinational Circuits - Analysis of Combinational Circuits - Design Procedure - Binary Adder - Subtractor - Decimal Adder - Binary Multiplier - Magnitude Comparator - Decoders - Encoders - Multiplexers - HDL Models of Combinational Circuits.

**UNIT - IV:**

Evolution of Microprocessor – Single chip Microcomputer – Microprocessor Applications – Buses- Memory Addressing capacity and CPU – Microcomputers – Processor Architecture – Intel 8085 – Instruction cycle – Timing Diagram.

**UNIT - V:**

Instruction Set of Intel 8085 – Instruction and Data Format – Address Modes – Status Flags – Intel 8085 instruction - Programming Microprocessor – Assembly language – Assembler.

**UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

## **REFERENCES:**

1. M. Morris R. Mano, Michael D. Ciletti. Digital Design: With an Introduction to the Verilog HDL, VHDL, and System Verilog, 6th Edition, 2018
2. Badri Ram, “Fundamentals of Microprocessors and Microcomputers”, Dhanpat Rai Publications, 2012.
3. Dhanasekharan Natarajan, "Fundamentals of Digital Electronics", Springer International Publishing, 2020
4. Dr. S Salivahanan, "Analog and Digital Electronic", McGraw-Hill Education, 2019.
5. Soumitra Kumar Mandal, "Digital Electronics", McGraw-Hill Education, 2018.
6. A. Anand Kumar, "Fundamentals of Digital Circuits", Prentice Hall India Pvt. Limited, 2016.
7. Senthil Kumar Saravanan, Jeevananthan, “Microprocessors and Microcontrollers”, Oxford University Press, 2010.

## **COURSE OUTCOMES:**

- CO1:** Understand about various number systems
- CO2:** Know about Boolean algebra and Logic Gates
- CO3:** Draw and explain Combinational circuits
- CO4:** Explain the Evolution of Microprocessors
- CO5:** Use the Instruction Set of Intel 8085 in simple programs.

## MAPPING

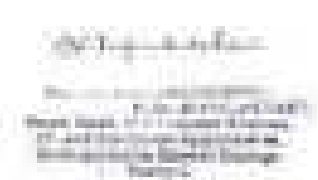
### CO - PO matrices of course

**1: Slight (Low) 2: Moderate (Medium)3: Substantial (High) If there is no correlation, put “-“**

### **CORE COURSE VII**

### **DIGITAL ELECTRONICS AND MICROPROCESSOR (22SCCCS7)**

PO/CO	PO1	PO2	PO3	PO4	PO5
22SCCCS7:1	2	3	3	3	3
22SCCCS7:2	2	3	3	3	3
22SCCCS7:3	2	3	3	3	2
22SCCCS7:4	2	3	3	3	2
22SCCCS7:5	2	3	3	3	2
AVERAGE	2	3	3	3	3



**CORE PRACTICAL-V**  
**DIGITAL ELECTRONICS AND MICROPROCESSOR**  
**LAB(22SCCCS5P)**

**THIRD YEAR**

**SEMESTER:V**

**A. Digital Electronics Experiments**

1. Verification of Logic gates
2. Construction of half and full adder
3. K-Map
4. Shift register
5. Up Down Counters

**B. Microprocessor Experiments**

1. Eight Bit Addition and Subtraction
2. Sum of series
3. Data transfer
4. Maximum of N Numbers
5. Decimal to Hexadecimal

**COURSE OUTCOMES:**

Upon successful completion of this course the students would be able to:

CO1: Verify the logic gate and the working of Adder and subtractors

CO2: Construct and study the function of Shift registers

CO3: Understand the working of Up Down Counters

CO4: To write simple ALPs and execute them

CO5: To manipulate an array with ALP..



## MAPPING

### CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

### CORE COURSE VII

### DIGITAL ELECTRONICS AND MICROPROCESSOR LAB

(22SCCCS5P)

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCCS7:1</b>	2	3	3	3	3
<b>22SCCCS7:2</b>	2	3	3	3	3
<b>22SCCCS7:3</b>	2	3	3	3	2
<b>22SCCCS7:4</b>	2	3	3	3	2
<b>22SCCCS7:5</b>	2	3	3	3	-
<b>AVERAGE</b>	2	3	3	3	2



# MAJOR BASED ELECTIVE I

## Semester V

### ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

#### UNIT - I:

Problems and Search : Searching strategies- Uninformed Search- breadth first search, depth first search, uniform cost search, depth limited search, iterativedeepening search, bidirectional search - Informed Search- Best first search, Greedy Best first search , A\* search – Constraint satisfaction problem , Localsearching strategies.

#### UNIT - II:

Reasoning: Symbolic Reasoning Under Uncertainty- Statistical Reasoning – Weak Slot-And-Filler-Structure - Semantic nets – Frames- Strong Slot-And-Filler Structure-Conceptual Dependency-Scripts- CYC.

#### UNIT - III:

Knowledge Representation: Knowledge Representation - Knowledge representation issues - Using predicate logic - Representing Knowledge Using Rules. SyntacticSemantic of Representation – Logic & slot and filler - Game Playing – Minimalsearch- Alpha beta cutoffs –Iterative deepening planning – component of planning system – Goal stack planning.

#### UNIT - IV:

Natural Language Processing: Natural Language Processing –Syntacticprocessing, semantic analysis-Parallel and Distributed AI-Psychological modeling parallelism and distributed in reasoning systems – Learning Connectionist Models – Hopfield networks, neural networks.

#### UNIT - V:

Expert Systems: Common Sense –qualitative physics, common sense ontologies memory organization -Expert systems –Expert system shells- explanation – Knowledge acquisition -Perception and Action – Real time search- robot architecture.

## **REFERENCES:**

1. Elaine Rich, Kevin Knight, "Artificial Intelligence", 3/e, Tata McGraw Hill, 2017.
2. Russell, "Artificial intelligence : A modern Approach , Pearson Education ,3<sup>rd</sup> edition,2013
3. I. Gupta, G. Nagpal, "Artificial Intelligence and Expert Systems", Mercury Learning & Information, 2020.
4. C.S. Krishnamoorthy, S. Rajeev, "Artificial Intelligence and Expert Systems for Engineers", CRC Press, 2018.
5. V. Daniel Hunt, "Artificial Intelligence & Expert Systems Sourcebook, Springer US, 2012.
6. Artificial Intelligence and Expert system by V.Daniel hunt, Springer press, 2011.
7. Nilsson N.J., "Principles of Artificial Intelligence", Morgan Kaufma

## **COURSE OUTCOMES:**

**CO1:** Understand the history of artificial intelligence (AI) and its foundations.

**CO2:** Describe the modern view of AI as the study of agents that receive percepts from the Environment and perform actions.

**CO3:** Demonstrate awareness of informed search and exploration methods.

**CO4:** Create knowledge of decision making and learning methods

**CO5:** Recall the concepts of expert systems.

## MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### MAJOR BASED ELECTIVE I

### ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

(22SMBECS1A)

PO/ CO	PO1	PO2	PO3	PO4	PO5
<b>22SMBECS1A:1</b>	2	3	3	3	3
<b>22SMBECS1A:2</b>	1	3	2	3	2
<b>22SMBECS1A:3</b>	2	3	2	3	1
<b>22SMBECS1A:4</b>	1	3	3	3	2
<b>22SMBECS1A:5</b>	2	3	2	3	2
<b>Average</b>	2	3	2	3	2

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**WEB TECHNOLOGY**

**UNIT - I:**

HTML: Introduction – SGML – Outline of an HTML Document – Head Section – Body Section – HTML Forms.

**UNIT - II:**

Java Script: Introduction – Language Elements – Objects of Java Script – Other Objects – Arrays.

**UNIT - III:**

VB Script: Introduction – Embedding VBScript Code in an HTML Document –Comments – Variables – Operators – Procedures – Conditional Statements –Looping Constructs – Object and VB Script – Cookies.

**UNIT - IV:**

Dynamic HTML (DHTML): Introduction – Cascading Style Sheets (CSS) DHTML Document Object Model and Collections – Event Handling.

**UNIT - V:**

Extensible Mark-Up Language (XML): Introduction – HTML vs XML – Syntax of the XML Document – XML Attributes – XML Validation – XML DTD – The Building Blocks of XML Documents – DTD Elements – DTD Attributes – DTD Entities – DTD Validation – XSL – XSL Transformation. D Elements – DTD Attributes – DTD Entities – DTD Validation – XSL – XSL Transformation.

**REFERENCES:**

1. N.P. Gopalan and J. Akilandeswari, Web Technology – A Developer’s Perspective, Prentice Hall of India Private Ltd, New Delhi, Second Edition, 2016.
2. C.Xavier, Web Technology and Design, NEW AGE; First edition, 2018
3. Steven M. Schafer, "HTML, XHTML, and CSS Bible", Wiley Publication, 2011
4. Keith Grant, "CSS in Depth", Manning Publication, 2018. 34
5. William Alvin Newton, Steven Webber, "Computer Programming JavaScript, Python, HTML, SQL, CSS", Independently Published, 2019.
6. Hasanraza ANSARI, "Learn VBScript", Independently Published, 2021.
7. <https://www.geeksforgeeks.org/web-technology/>

**COURSE OUTCOMES:**

- CO1:** Understand and apply the webpage concepts.
- CO2** Develop static and dynamic web pages.
- CO3:** Understand the features of JavaScript and VB Script.
- CO4:** Develop knowledge about XML fundamentals and usage of XML technology.
- CO5:** Understand about web design with XSL and data validation with DTD.

## MAPPING

### CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium)3: Substantial (High) If there is no correlation, put “-“**

### **SKILL BASED ELECTIVE-I**

### **Semester V - WEB TECHNOLOGY**

**(22SSBECS1)**

<b>PO/ CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>22SSBECS1:1</b>	3	3	3	3	2
<b>22SSBECS1:2</b>	3	2	2	3	2
<b>22SSBECS1:3</b>	3	2	2	3	3
<b>22SSBECS1:4</b>	3	3	2	3	2
<b>22SSBECS1:5</b>	3	2	2	3	2
<b>Average</b>	3	2	2	3	2



# **B.Sc - Computer Science/ BCA / B.Sc – Information Technology**

**Third Year**

**PART-IV**

**Semester V**

## **SOFT SKILLS DEVELOPMENT (22UGSDC)**

### **UNIT-I KNOW THYSELF / UNDERSTANDING SELF:**

Introduction to Soft skills-Self-discovery-Developing positive attitude-Improving perceptions- Forming values.

### **UNIT -II INTERPERSONAL SKILLS/ UNDERSTANDING OTHERS:**

Developing interpersonal relationship-Team building-group dynamics-Networking-Improved work relationship

### **UNIT -III COMMUNICATION SKILLS / COMMUNICATION WITH OTHERS:**

Art of listening –Art of reading –Art of speaking –Art of writing-Art of writing e-mails e mail etiquette.

### **UNIT- IV CORPORATE SKILLS / WORKING WITH OTHERS**

Oral Presentation – Memos- Note taking - Note making and preparing Minutes- Reports, Proposals, Abstracts - Technical Writing.

### **UNIT -V SELLING SELF / JOB HUNTING**

Writing resume/cv-interview skills-Group discussion- Mock interview-Mock GD – Goal setting - Career planning

### **UNIT - VI: CURRENT CONTOURS: (for continuous internal assessment only):**



## **REFERENCES:**

1. N. Krishnasamy, Manju Dhariwel and Lalitha Krishnasamy(2015). Mastering Communication Skills and Soft Skills – Bloomberg.
2. Meena.K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills : A Road Map to Success), P.R. Publishers & Distributors,
3. Meera Banerjee and Krishna Mohan: Developing Communication Skills, Trinity Publishers- (Lakshmi Publications.
4. Alex K. (2012) Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi- 110 055.

## **COURSE OUTCOMES:**

**CO1** : Develop listening, speaking, reading and writing skills in English.

**CO2** : Enhance soft skills and engage in a range of communicative tasks and activities

**CO3** : Comprehend a text and identify specific and global information

**CO4** : Promote communicative ability in both spoken and written form of the language

**CO5** : Develop interpersonal skills to maintain human relationship

**CO6** : Develop corporate skills to promote leadership qualities and team spirit.

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## MAPPING

### CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“**

### **PART-IV SOFT SKILLS DEVELOPMENT (22UGSDC)**

PO CO	PO1	PO2	PO3	PO4	PO5
<b>22UGSDC:1</b>	2	3	3	2	1
<b>22UGSDC:2</b>	2	3	3	1	2
<b>22UGSDC:3</b>	2	3	3	2	1
<b>22UGSDC:4</b>	2	3	3	1	2
<b>22UGSDC:5</b>	2	3	3	2	2
<b>Average</b>	2	3	3	2	2



## **CORE COURSE VIII**

### **OPERATING SYSTEMS (22SCCCS8/ 22SCCCA8/ 22SCCIT6 )**

**UNIT - I:** Introduction - What Is an Operating System-Operating System Software -A Brief History of Machine Hardware -Types of Operating Systems - Brief History of Operating System Development-Object-Oriented Design

**UNIT - II:** Early Systems: Single-User Contiguous Scheme -Fixed Partitions-Dynamic Partitions- Best-Fit versus First-Fit Allocation -Deallocation - Relocatable Dynamic Partitions. Virtual Memory: Paged Memory Allocation-Demand PagingPage Replacement Policies and Concepts -Segmented Memory AllocationSegmented/Demand Paged Memory Allocation - Virtual Memory-Cache Memory

**UNIT - III:** Overview-About Multi-Core Technologies-Job Scheduling Versus Process Scheduling- Process Scheduler-Process Scheduling Policies-Process Scheduling Algorithms –A Word About Interrupts-Deadlock-Seven Cases of Deadlock - Conditions for Deadlock- Modeling Deadlock-Strategies for Handling Deadlocks – Starvation- Concurrent Processes: What Is Parallel Processing-Evolution of Multiprocessors- Introduction to Multi-Core Processors-Typical Multiprocessing Configurations--Process Synchronization Software.

**UNIT - IV:** Types of Devices-Sequential Access Storage Media-Direct Access Storage DevicesMagnetic Disk Drive Access Times- Components of the I/O SubsystemCommunication among Devices-Management of I/O Requests

**UNIT - V:** The File Manager -Interacting with the File Manager -File Organization – Physical Storage Allocation -Access Methods-Levels in a File Management System – Access Control Verification Module

**UNIT - VI** CURRENT CONTOURS (for Continuous Internal Assessment Only):  
Contemporary Developments Related to the Course during the Semester Concerned

## REFERENCES:

- Ann McIver Mc Hoes, Ida M. Flynn, "Understanding Operating Systems", Course Technology, Cengage Learning, 2011.
- Greg Tomsho,"Guide to Operating Systems", Cengage Learning, 2020.
- Cesar Herrera, Darrell Hajek, Flor Narciso, "Principles of Operating Systems", Amazon Digital Services LLC - KDP Print US, 2020.
- Cesar Herrera, Darrell Hajek,"Principles of Operating Systems", Independently Published, 2019.
- Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau,"Operating Systems: Three Easy Pieces", Create Space Independent Publishing Platform, 2018.
- Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "Operating System Concepts", Wiley Publisher, 2018. 7. <https://www.guru99.com/os-tutorial.html>

## COURSE OUTCOMES:

**CO1** : Recall the basic principles and importance of the operating system in a computer

**CO2** : Illustrate the objectives and functions of the operating system components

**CO3** : Identify the various operating system techniques

**CO4** : Analyse the issues and challenges of the operating system and security mechanisms

**CO5** : Evaluate the functions and features of file management in operating systems

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# MAPPING

## CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

### CORE COURSE VIII OPERATING SYSTEMS (22SCCCS8/ 22SCCCA8/22SCCIT6)

PO CO	PO1	PO2	PO3	PO4	PO5
22SCCCS8/ 22SCCCA8/ 22SCCIT6:1	3	3	3	3	3
22SCCCS8/ 22SCCCA8/ 22SCCIT6:2	3	3	3	3	3
22SCCCS8/ 22SCCCA8/ 22SCCIT6:3	2	3	3	3	2
22SCCCS8/ 22SCCCA8/ 22SCCIT6:4	2	3	3	3	2
22SCCCS8/ 22SCCCA8/2 2SCCIT6:5	2	3	3	3	2
<b>Average</b>	3	3	3	3	3

  
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## **SYLLABUS: 22SCCCS9/ 22SCCCA9 - CORE COURSE IX -(CC) PROGRAMMING IN PHP**

**UNIT - I:** Essentials of PHP - Operators and Flow Control - Strings and Arrays.

**UNIT - II:** Creating Functions - Reading Data in Web Pages - PHP Browser – Handling Power.

**UNIT - III:** Object-Oriented Programming –Advanced Object-Oriented Programming

**UNIT - IV:** File Handling –Working with Databases – Sessions, Cookies, and FTP

**UNIT - V:** Ajax – Advanced Ajax – Drawing Images on the Server.

**UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**  
Contemporary Developments Related to the Course during the Semester Concerned

### **REFERENCES:**

1. Steven Holzner, The PHP Complete Reference, McGraw Hill Education, 2007. 2
2. Vikram Vaswani, PHP: A Beginner's Guide, McGraw Hill Education, 2008.
3. Don Gosselin, Diana Kokoska, Robert Easterbrooks, "PHP Programming with MySQL", Course Technology, 2010.
4. Kevin Tatroe, Peter MacIntyre, Rasmus Lerdorf, " Programming PHP: Creating Dynamic Web Pages", O'Reilly Media, 2013.
5. Alan Forbes, "The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL, Create Space Independent Publishing Platform, 2015.
6. Antonio Lopez, "Learning PHP 7, Packt Publishing, 2016.
7. <https://www.guru99.com/php-tutorials.html>

### **COURSE OUTCOMES:**

**CO1:** Understand the fundamental knowledge of developing web applications with PHP.

**CO2:** Illustrate the advanced concepts like strings, arrays and functions

**CO3:** Design Web based applications.

**CO4:** Analyze and solve various database tasks using PHP.

**CO5:** Develop AJAX based applications.

# MAPPING

## CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

### **22SCCCS9 / 22SCCCA9 - CORE COURSE IX -(CC)**

### **PROGRAMMING IN PHP**

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCCS9:1/ 22SCCCA9:1</b>	3	3	2	3	2
<b>22SCCCS9:2/ 22SCCCA9:2</b>	3	2	2	3	2
<b>22SCCCS9:3/ 22SCCCA9:3</b>	3	3	3	3	3
<b>22SCCCS9:4/ 22SCCCA9:4</b>	3	3	3	3	3
<b>22SCCCS9:5/ 22SCCCA9:4</b>	3	3	3	3	3
<b>Average</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

  
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**SYLLABUS: 22SCCCS6P / 22SCCCA6P - Core Practical – VI (CP)**  
**PROGRAMMING IN PHP LAB -(Practical)**

1. Write a program to find the factorial of a number.
2. Write a program using Conditional Statements need a number N and check whether it is divisible by M
3. Write a program to find the maximum value in a given multi-dimensional array.
4. Write a program to find the GCD of two numbers using user-defined functions.
5. Design a simple web page to generate multiplication table for a given number.
6. Design a web page that should compute one's age on a given date.
7. Write a program to download a file from the server.
8. Write a program to store the current date and time in a COOKIE and display the 'Last Visited' date and time on the web page.
9. Write a program to store page views count in SESSION, to increment the count on each refresh and to show the count on web page.
10. Write a program to design a simple calculator.
11. Design an authentication web page in PHP with MySQL to check username and password.

**COURSE OUTCOMES:**

**CO1 :** Learn PHP programming on handling strings and arrays.

**CO2:** Design web pages for different applications with MYSQL

**CO3:** Handle files, sessions and cookies by downloading a file from the server.

**CO4 :** Develop real-time applications.

**CO5 :** Gain experience in drawing images using Ajax.



## MAPPING

CO - PO – PSO matrices of course


1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

22SCCCS6P / 22SCCCA6P - Core Practical – VI (CP)

PROGRAMMING IN PHP LAB - (Practical)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22SCCCS6P:1/ 22SCCCA6P:1	3	3	3	3	3
22SCCCS6P:2 / 22SCCCA6P:2	3	3	3	3	3
22SCCCS6P:3 / 22SCCCA6P:3	3	3	3	3	3
22SCCCS6P:4/22SCCCA6P:4	3	3	3	3	3
22SCCCS6P:5/ 22SCCCA6P:5	3	3	3	2	2
Average	3	3	3	3	3

  
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## **SYLLABUS: 22SMBECS2B - MAJOR BASED ELECTIVE II - BIG DATA ANALYTICS**

**UNIT - I:** Introduction: Concepts and Terminology – Big Data Characteristics – Different Types of Data –case study Background – Business goals and Obstacles – Business Motivations and Drivers for Big Data Adoption-Marketplace Dynamic – Business Architecture- Business Process Management.

**UNIT - II:** Big data Adoption and Planning Considerations: Organization Prerequisites – Data Procurement – Privacy – Security – Provenance – Limited Real-time Support – Distinct Performance Challenges – Distinct Governance Requirements – Distinct Methodology – Big Data Analytics – Data Identification – Data Acquisition and Filtering – Data Extraction – Data validation and cleansing – Data Aggregation and Representation.

**UNIT - III:** Enterprise Technologies and Big Data Business Intelligence: Online Transaction and Processing (OLTP) – Online Analytical Processing (OLAP) – Extract Transform Load (ETL) – Data Warehouses – Data Marts.

**UNIT - IV:** Big Data Processing Concepts: Introduction – Parallel Data Processing – Distributed Data Processing – Hadoop – Processing Workloads – Cluster – Processing in Batch Mode – Map – Combine – Partition – Shuffle and Sort.

**UNIT - V:** Big Data Storage Technology: On-Disk Storage Devices – NoSQL Database – In Memory Storage Device – Big Data Analytics Techniques – Quantitative Analysis – Qualitative Analysis – Data Mining – Statistical Analysis – A/B Testing – Correlation-Regression – Machine Learning.

**UNIT - VI : CURRENT CONTOURS (for Continuous Internal Assessment Only):  
Contemporary Developments Related to the Course during the Semester Concerned.**

**REFERENCES:**

1. Paul Buhler, Wajid Khattak and Thomas Erl, “Big Data Fundamentals: Concepts, Drivers & Techniques”, Prentice Hall Publications, 1st Edition, January 2016.
2. Dr. A.V.K. Shanthi, Dr. Praveen Kumar Misra, Dr. Bramah Hazela, Dr. Saptarshi Gupta, published a book “Big Data Analytics- Discovering, Analysing, Visualizing and Presenting Data”, by Scientific International Publishing House.
3. Soraya Sedkaoui, "Data Analytics and Big Data", Wiley, 2018.
4. DT Editorial Services, “Big Data (Hadoop 2, Map Reduce, Hive, YARN, Pig, R and Data Visualization) Black Book”, 1st Edition, Dreamtech Press, 2016.
5. Soumendra Mohanty, Madhu Jagadeesh, and Harsha Srivatsa, “Big Data Imperatives: Enterprise Big Data Warehouse, BI Implementations and Analytics”, Apress Media, 2013.
6. Tom White, “Hadoop: The Definitive Guide”, Third Edition, O’Reilly Media, 2012.

**COURSE OUTCOMES:**

**CO1:** Recall the basics of Big Data

**CO3:** Apply the cutting-edge tools and technologies to analyze Big Data

**CO4:** Analyse various big data tools and techniques

**CO5:** Evaluate various storage and analytical techniques.

# MAPPING


## CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

### **22SMBECS2B - MAJOR BASED ELECTIVE II - BIG DATA ANALYTICS**

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
<b>22SMBECS2B : 1</b>	3	2	2	2	2
<b>22SMBECS2B : 2</b>	3	3	3	3	2
<b>22SMBECS2B : 3</b>	3	3	3	3	3
<b>22SMBECS2B : 4</b>	3	3	3	3	3
<b>22SMBECS2B : 5</b>	3	3	3	3	3
<b>Average</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

  
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## **22SSBECA1 - SKILL BASED ELECTIVE I**

### **MOBILE APPLICATION DEVELOPMENT**

**UNIT - I:** Introduction to Android: The Android Platform, Android SDK, Eclipse Installation, Android Installation, building you First Android application, Understanding Anatomy of Android Application, Android Manifest file

**UNIT - II:** Android Application Design Essentials: Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions

**UNIT - III:** Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation

**UNIT - IV:** Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

**UNIT - V:** Using Common Android APIs: Using Android Data and Storage APIs, managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

**UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):** Contemporary Developments Related to the Course during the Semester Concerned

#### **REFERENCES:**

1. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education, 2011. 36
2. Reto Meier, “Professional Android Application Development”, Wiley India Pvt Ltd, 2010
3. Mark L Murphy, “Beginning Android3”, Apress Publications, 2011.
4. Bill Phillips, Chris Stewart, Kristin Marsicano, Brian Gardner, "Android Programming", Big Nerd Ranch, 2019.
5. Barry Burd, John Paul Mueller, “Android Application Development All in one for Dummies", Wiley Publications, 2020.
6. NamrataBandeekar, Darryl Bayliss, Fuad Kamal, "Android Apprentice (Fourth Edition) Beginning Android Development with Kotlin", R R BOWKER LLC, 2021.
7. <https://www.javatpoint.com/android-tutorial>

**COURSE OUTCOMES:**

**CO1:** Identify various concepts of mobile application programming in Android platform

**CO2:** Implement the business logic in an app with java

**CO3:** Understand Android User Interface Design with XML

**CO4:** Know about Common Android APIs

**CO5:** Deploy applications to the Android marketplace for distribution.

**MAPPING**


**CO - PO – PSO matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

**22SSBECA1-- SKILL BASED ELECTIVE I – MOBILE APPLICATION DEVELOPMENT**

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
<b>22SSBECA1 :1</b>	3	3	3	2	2
<b>22SSBECA1 :2</b>	3	3	3	3	3
<b>22SSBECA1 :3</b>	3	3	3	3	3
<b>22SSBECA1 :4</b>	3	3	3	3	3
<b>22SSBECA1 :5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3

  
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# **GENDER STUDIES**

## **SEMESTER VI**

### **UNIT- I**

**INTRODUCTION TO GENDER STUDIES CONCEPTS** Gender Spectrum.-Sex – Gender distinction – Biological Determinism – Patriarchy – Feminism –Gender Socialization and Stereotyping-Gender Discrimination – Gender Division of labour and roles– Gender Sensitivity and awareness – Gender Equity – Equality – Gender Main streaming and Gender Analysis.

### **UNIT- II**

**UGC INITIATIVES ON WOMEN’S STUDIES** Definition of Women’s Studies –Gender Studies –UGC Initiatives and guidelines on Women’s Studies - Beijing Conference, UN Initiatives – Convention on Elimination of All forms of Discrimination Against Women (CEDAW)- Sustainable Development Goals on Gender Equality (SDG 5) and targets

### **UNIT- III**

**AREAS OF GENDER DISCRIMINATION** Gender Socialization- Sex Ratio– Health and Nutrition– –Literacy and Education - Employment- Governance – participation in decision making- politics- property rights and access to credit- gender based violence- Social institutions –Family, Caste, Class, religion, gender, State. Market – Media – Politics – Judiciary

### **UNIT -IV**

**WOMEN DEVELOPMENT AND GENDER EMPOWERMENT** Towards Equality Report of Status of Women in India 1974 – International Women’s Decade – International Women’s Year – National Policy for Empowerment of Women 2001

### **UNIT -V**

**WOMEN’S MOVEMENTS AND SAFEGUARDING MECHANISM** : In India National /State Commission for Women(NCW) – All Women Police Station – Family Court Legislations safeguarding women –Transgender Policy—Constitutional amendments for women’s political participation

### **UNIT - VI**

**CURRENT CONTOURS:** (for continuous internal assessment only): Tamil Nadu State Policy for Women 2021- National Policy for Women 2015 – Prevention of Sexual Harassment at Work places Act 2013- Protection of Children from Sexual Offences Act, 2012 - Analysis of regressive and progressive High court and supreme court judgments- women proactive policies, programmes, interventions

## **REFERENCE :**

1. Bhasin Kamala, Understanding Gender : Gender Basics , New Delhi : Women Unlimited , 2004
2. Bhasin Kamala, Exploring Masculinity: Gender Basics , New Delhi: Women Unlimited ,2004
3. Bhasin Kamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited ,1993
4. Arya Sadhna Women ,Gender Equality and the State ,New Delhi :Deep &Deep Publication ,2000
5. Mishra .O.P, Law Relating to Women & Child ,Allahabad :Central Law Agency ,2001
6. Uma Chakravarti, Gendering Caste Through a Feminist Lens, Sage Publication 2003 3
7. Bhattacharya Malini , Sexual Violence and Law ,Kolkata; West Bengala Commission for Women ,2002
8. Sexual Harassment at the Workplace – A Guide , New Delhi ;Sakshi,1999
9. <https://www.schooloflegaleducation.com/women-and-law-in-india-e-book/>

## **COURSE OUTCOMES:**

**CO1:** Students would have gained a perspective and understood the social reality of gender society understood the differences of gender and sex and may resort to building alternative perspectives and critical thinking.

**CO2:** Gained knowledge on the various social institutions governing gender and the intersectionality.

**CO3:** Exposed to the kind of initiatives of the State towards gender equality



## MAPPING


### CO - PO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

### **UGGS –U PART V – GENDER STUDIES**

PO CO	PO1	PO2	PO3	PO4
<b>UGGS :1</b>	3	3	3	3
<b>UGGS :2</b>	3	3	3	3
<b>UGGS :3</b>	3	3	3	3
<b>Average</b>	3	3	3	3

  
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## **DATA MINING AND DATA WAREHOUSING (22SMBECA1B)**

### **UNIT - I:**

Basic Data Mining Tasks – Data Mining Versus Knowledge Discovery in Data Bases – Data Mining Issues – Data Mining Matrices – Social Implications of Data Mining – Data Mining from Data Base Perspective.

### **UNIT - II:**

Data Mining Techniques – a Statistical Perspective on data mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms.

### **UNIT - III:**

Classification: Introduction – Statistical – Based Algorithms – Distance Based Algorithms – Decision Tree – Based Algorithms – Neural Network Based Algorithms – Rule Based Algorithms – Combining Techniques. Clustering: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms. Partitioned Algorithms.

### **UNIT - IV:**

Data Warehousing: An introduction - characteristic of a data warehouse - datamats - other aspects of data mart. Online analytical processing: introduction OLTP & OLAP systems - data modeling - star schema for multidimensional view data modeling - multi fact star schema or snowflake schema - OLAP TOOLS - state of the market - OLAP TOOLS and the internet

### **UNIT - V:**

Developing a data WAREHOUSE: Why and how to build a data ware house architectural strategies and organization issues-design consideration- data content-metadata distribution of data - tools for data warehousing - performance consideration-crucial decision in designing a data warehouse. Applications of data warehousing and data mining in government: Introduction -National data warehouses- other areas for data warehousing and data mining

### **UNIT - VI: CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

## REFERENCES:

1. Margaret H. Dunham, Data Mining Introductory and Advanced Topics, Pearson Education – 2003.
2. Arun K. Pujari, “Data Mining Techniques”, Universities Press, 2010.
3. Jiawei Han & Micheline Kamber, “Data mining Concepts & Techniques”, Academic press, 2001
4. Alex Berson, Stephen J. Smith, “data warehousing, data mining, & OLAP, TMCH, 2001.
5. Margaret H. Dunham, “Data mining introductory and advanced topics”, Pearson education, 2003
6. Arun K. Pujari, “Techniques”, Universities Press (India) Pvt. Ltd., 2003.
7. C.S.R. Prabhu, “Data warehousing concepts, techniques, products and an application”, PHI, Second Edition, 2008
8. <https://www.javatpoint.com/data-mining>
9. <https://www.javatpoint.com/data-warehouse>

## COURSE OUTCOMES:

- CO1:** Identify data mining tools and techniques in building intelligent machines.
- CO2:** Analyze various data mining algorithms to be applied in real time applications.
- CO3:** Demonstrate the data mining algorithms in combinatorial optimization problems.
- CO4:** Illustrate the mining techniques like association, classification and clustering on transactional databases.
- CO5:** Perform exploratory analysis of the data to be used for mining

# MAPPING

## CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

### DATA MINING AND DATA WAREHOUSING (22SMBECA1B)

PO \ CO	PO1	PO2	PO3	PO4	PO5
22SMBECA1B:1	3	3	3	3	3
22SMBECA1B:2	3	3	2	2	2
22SMBECA1B:3	3	3	2	3	2
22SMBECA1B:4	3	3	2	2	2
22SMBECA1B:5	3	3	3	3	2
Average	3	3	3	3	2



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## **E-COMMERCE TECHNOLOGIES (22SMBECA2B)**

### **UNIT - I:**

E-Commerce–Electronic Commerce – E-Commerce types – E-Commerce and world at the large – E Commerce Case studies: Intel, Amazon

### **UNIT - II:**

Electronic Mail – The X, 400 Messages handling system – Internet addresses – Multipurpose Internet mail Extension – X.500 Directory Services – E-Mail User agent.

### **UNIT - III:**

EDI– Costs and benefits – Components of EDI Systems – EDI implementation issues – EDIFACT – EDIFACT Message Structure.

### **UNIT - IV:**

Cyber Security – Cyber Attacks – Hacking – SSL – Authentication and assurance of DATA integrity – Cryptographic based solution – Digital Signatures – VPN.

### **UNIT - V:**

Electronic Payment Systems – Payment gateway – internet banking – the SET protocol – E-Cash – E-Cheque – Elements of electronics payments

### **UNIT VI: CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

## REFERENCES:

1. Kamalesh. Kbalaji, Debjani Nag —E–Commerce – The Cutting Edge of Business 2<sup>nd</sup> Edition, Tata McGraw Hill. Year.
2. Whinston, Andrew B., and Kalakota, Ravi, Frontiers of ElectronicCommerce, DIANE Publishing Company, 1999.
3. S.Jaiswal, E–Commerce :Doing Business through internet, Galgotia Publication, 2001
4. Rajaraman V, Essentials of E-Commerce Technology, PHI Learning, 2009.
5. Qin, Zheng, Introduction to E-commerce, Tsinghua University Press, 2009.
6. Manzoor, Amir,E-commerce: An Introduction. Germany, Lambert Academic Publishing, 2010.
7. [https://www.tutorialspoint.com/e\\_commerce/index.htm#](https://www.tutorialspoint.com/e_commerce/index.htm#):

## COURSE OUTCOMES:

**CO1:** Know the E-Commerce process

**CO2:** Describe an example of system architecture for an e-Business system

**CO3:** Use and appreciate elements of web design.

**CO4:**Identify and explain fundamental web site tools including design tools, programming tools, and data processing tools.

**CO5:** Identify the major electronic payment issues and solutions

# MAPPING

## CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“**

### **E-COMMERCE TECHNOLOGIES (22SMBECA2B)**

PO\CO	PO1	PO2	PO3	PO4	PO5
22SMBECA2B:1	3	3	3	3	3
22SMBECA2B:2	3	3	2	2	2
22SMBECA2B: 3	3	3	2	3	2
22SMBECA2B: 4	3	3	2	2	2
22SMBECA2B :5	3	3	3	3	2
Average	3	3	2	3	2



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## **INTERNET OF THINGS (22SSBECA2)**

### **UNIT - I:**

INTRODUCTION - Definition & characteristics of IoT - physical design of IoT - logical design of IoT - IoT enabling Technologies - IoT levels & Deployment templates. Domain specific IoT : Home Automation - cities - Environment - Energy - retail - logistics - Agriculture - Industry Health and life style.

### **UNIT - II:**

IOT and M2M - Deference between Iot and M2M - SDN and NFV for lot - IoT systems management - SNMP - YANG – NETOPEER.

### **UNIT - III:**

IOT SPECIFICATION IoT platforms design Methodology - purpose and specification - process specification - Domain model specification - Information model specification - Service specification - IoT level specification - functional view specification - operational view specification - Device and component Integrators - Application Development.

### **UNIT - IV:**

LOGICAL DESIGN USING PYTHON Logical design using python - Installing python - type conversions - control flow - functions - modules - File handling - classes. IoT physical devices and End points, building blocks of IoT device - Raspberry Pi - Linux on Raspberry Pi - Raspberry Pi interfaces.

### **UNIT - V:**

IOT AND CLOUD COMPUTING IoT physical servers & cloud computing - WAMP - Xively cloud for IoT - python Web application frame work - Amazon web services for IoT.

### **UNIT - VI**

CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned



## REFERENCES:

1. Arshdeep Bahga, Vijay Madiseti, Internet of Things - A hands on Approach, Universities Press.2015.
2. Samuel Greengard, The Internet of Things MIT Press, 2015.
3. BK Tripathy, J Anuradha, Internet of Things (IoT): Technologies, Applications, Challenges and Solutions,CRC Press, 2017.
4. Srinivasa K.G., Siddesh G.M. Hanumantha Raju R, Internet of Things, Cengage Learning India pvt. Ltd 2018
5. Jamil Y. Khan, Mehmet R. Yuce, Internet of Things (IoT): Systems and Applications, Jenny Stanford Publishing, 2019.
6. Kumar, Sudhir, Fundamentals of Internet of Things, CRC Press, 2021.
7. [https://www.tutorialspoint.com/internet\\_of\\_things/index.htm#](https://www.tutorialspoint.com/internet_of_things/index.htm#).

## COURSE OUTCOMES:

- CO1:** Understand the fundamentals of Internet of Things.
- CO2:** Know the basics of communication protocols and the designing principles of Web connectivity
- CO3:** Gain the knowledge of Internet connectivity principles
- CO4:** Design and develop smart city in IoT
- CO5:** Analyse and evaluate the data received through sensors in IoT.


## MAPPING

### CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“**

#### INTERNET OF THINGS (22SSBECA2)

PO \ CO	PO1	PO2	PO3	PO4	PO5
22SSBECA2:1	3	3	3	3	3
22SSBECA2:2	2	3	2	2	2
22SSBECA2:3	3	3	3	3	3
22SSBECA2:4	2	3	2	2	2
22SSBECA2:5	3	3	3	3	3
Average	2	3	3	3	3

  
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## **CORE COURSE VII - SOFTWARE ENGINEERING - 22SCCIT7**

**Third Year**

**Semester V**

### **UNIT - I:**

Introduction: Introduction to Software Engineering - Software Process – Software Process Models - Software Model - Requirements Engineering Principles: Requirements Engineering - Importance of Requirements - Types of Requirements  
- Steps involved in Requirements Engineering.

### **UNIT - II:**

Requirements Analysis Modeling: Analysis Modeling Approaches - Structured Analysis - Object Oriented Analysis - Design and Architectural Engineering : Design Process and Concepts - Basic Issues in Software Design - Characteristics of Good Design - Software Design and Software Engineering - Function Oriented System vs Object Oriented System - Modularity, Cohesion, Coupling, Layering - Real Time Software Design - Design Models - Design Documentation.

### **UNIT - III:**

Object Oriented Concepts: Fundamental Parts of Object Oriented Approach – Data Hiding and Class Hierarchy Creation - Relationships - Role of UML in OO Design - Design Patterns - Frameworks - Object Oriented Analysis - Object Oriented Design - User Interface Design : Concepts of User Interface - Elements of User Interface - Designing the User Interface - User Interface Evaluation - Golden Rules of User Interface Design - User Interface Models - Usability

### **UNIT - IV:**

Software Coding - Introduction to Software Measurement and Metrics – Software Configuration - Project Management Introduction - Introduction to Software Testing - Software Maintenance

### **UNIT - V:**

Web Engineering : Introduction to Web - General Web Characteristics – Web Application Categories - Working of Web Application - Advantages and Drawbacks of Web Applications - Web Engineering - Emerging Trends in Software Engineering – Web 2.0 - Rapid Delivery - Open Source Software Development - Security Engineering - Service Oriented Software Engineering - Web Service - Software as a Service – Service Oriented Architecture - Cloud Computing – Aspect Oriented Software Development - Test Driven Development - Social Computing

### **UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned

**REFERENCES:**

1. Chandramouli Subramanian, Saikat Dutt Chandramouli Seetharaman, B.G. Geetha, Software Engineering, Pearson Publications, 2015.
2. Software Engineering, Jibitesh Mishra, Pearson Education, 2011.
3. Ian Sommerville, "Software Engineering", Pearson, 2011.
4. Rod Stephens, "Beginning Software Engineering", Wiley, 2015.
5. Ashfaque Ahmed, Bhanu Prasad, "Foundations of Software Engineering", CRC Press, 2016.
6. Titus Winters, Tom Manshreck, Hyrum Wright, "Software Engineering at Google", O'Reilly Media, 2020.

**COURSE OUTCOMES:**

**CO1:** Recall the various techniques of software process models.

**CO2:** Understand the requirements for a software project.

**CO3:** Develop frameworks for software projects.

**CO4:** Apply the knowledge, techniques, and skills in the development of a software product.

**CO5:** Make use of web engineering concepts for software development.

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## MAPPING

### CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

#### CORE COURSE VII SOFTWARE ENGINEERING 22SCCIT7

PO/ CO	PO1	PO2	PO3	PO4	PO5
22SCCIT7:1	3	3	3	3	3
22SCCIT7:2	3	3	3	3	3
22SCCIT7:3	3	3	3	3	3
22SCCIT7:4	2	3	3	3	3
22SCCIT7:5	3	3	3	3	3
<b>Average</b>	3	3	3	3	3



## **CORE COURSE V - PRINCIPLES OF INFORMATION TECHNOLOGY (22SCC IT5)**

**Third Year**

**Semester V**

### **UNIT - I:**

Internet: The wired world of the internet – Information travels across the internet – TCP/IP – Understanding internet addresses and domains – Anatomy of web connections – Internet file types. Internet's Underlying Architecture: Domain name system – Routers – The internet's client/server architecture.

### **UNIT - II:**

Connecting to the internet: Connecting your computer – Connecting to the internet from online services – ISDN – The internet/television connection – Network computers – DSL (Digital Subscriber Line). Communicating on the internet: E-mail – Usenet and newsgroups – Internet chat and instant messaging – Making phone calls on the internet.

### **UNIT - III:**

World Wide Web: Web pages – Web browsers – Markup Languages – Hypertext – Image maps and interactive forms – Web host servers – Websites with databases. Common Internet Tools: Gophers – Telnet – FTP and downloading files – Searching the internet.

### **UNIT-IV:**

Multimedia on the Internet: Audio on the internet – Video on the internet – Intranet and shopping on the internet.

### **UNIT - V:**

Safeguarding the internet: Firewalls – Viruses – Digital certificates.

### **UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

**REFERENCES:**

1. Preston Gralla, "How the Internet Works", 10<sup>th</sup> Edition, Que Publishers, 2014.
2. Raj Kamal, "Internet and Web Technologies", Tata McGraw Hill, 2002. 2. C Xavier, "World Wide Web design with HTML", Tata Mc-Graw Hill, 2008.
3. Bergkvist, Lorraine N., and Austin, Kathleen M.. Principles of Information Technology, Goodheart-Willcox Company, 2015.
4. Stair, Ralph, and Reynolds, George, Fundamentals of Information Systems, Cengage Learning, 2015.
5. Principles of Information Technology- Texas. United Kingdom, Pearson Education, 2016.
6. Rajaraman, V, Introduction to Information Technology, PHI Learning Pvt. Ltd., 2018.

**COURSE OUTCOMES:**

**CO1:** Understand the terms related to Information Technology

**CO2:** Know the usage of E-Mail and ISDN

**CO3:** Acquire the concepts of Markup Languages and Common Internet Tools

**CO4:** Develop Knowledge about Multimedia on the internet

**CO5:** Recall the concepts of firewalls and viruses.

## MAPPING

### CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

#### CORE COURSE V

#### PRINCIPLES OF INFORMATION TECHNOLOGY (22SCC IT5)

PO \ CO	PO1	PO2	PO3	PO4	PO5
22SCC IT5:1	3	3	3	3	3
22SCC IT5:2	2	3	3	3	3
22SCC IT5:3	3	3	3	3	3
22SCC IT5:4	3	3	3	3	3
22SCC IT5:5	3	3	3	2	3
Average	3	3	3	3	3





1. Create an ASP file to display the message “Have a Good Weekend” if it is a Saturday otherwise “Hang in there, the week will get better”.
2. Write a program to get the name and favorite ice cream flavor. Respond with the price of the corresponding ice cream.
3. Create a login form, to expire, if the user does not type the password within 100 seconds.
4. Create an advertisement for a bookshop using Ad Rotator component.
5. Create a course registration form with name, address and list of available course. Reply with the corresponding course fees on selection of a single course or a collection of courses.
6. Write a program to manipulate cookies with the information between HTTP sessions such as
  - i. Last Date visited
  - ii. Last Time visited
  - iii. Number of visits
7. Create a student database and manipulate the records using the connection object in ASP.
8. Create an employee database and manipulate the records using command object in ASP.

**COURSE OUTCOMES:**

**CO1:** Acquire skills in fundamentals of ASP.Net programming.

**CO2:** Develop simple programs using Components.

**CO3:** Know the art of programming using HTTP Sessions

**CO4:** Use cookies in ASP applications.

**CO5 :**Write programs using Connection and Command objects.

## MAPPING

### CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

#### ASP DOT NET LAB 22SCC IT4P

PO CO	PO1	PO2	PO3	PO4	PO5
<b>22SCC IT4P:1</b>	3	3	3	3	3
<b>22SCC IT4P:2</b>	2	3	3	3	3
<b>22SCC IT4P:3</b>	3	3	3	3	3
<b>22SCC IT4P:4</b>	3	3	3	3	3
<b>22SCC IT4P:5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3



**UNIT - I:**

Introduction to ASP – Active Server Pages Model – ASP File – the process of serving an Active Server Page – Using Scripting Languages – Setting the Primary Scripting Language – Including other files – Understanding objects.

**UNIT - II:**

Understanding components – Working with users – working with HTML forms – retrieving form data – using text boxes and text areas.

**UNIT - III:**

Cookies – working with cookies – applications of cookies – addressing the drawbacks of using cookies – using cookies in ASP applications. Working with connections and data sources – creating connections with OLEdb and ODBC – connecting to Microsoft SQL server – connecting to a Microsoft access database.

**UNIT - IV:**

About the connection object – executing a SQL statement with the connection object – understanding session and connection pooling – working with record sets – retrieving a record set – record set cursor and locking types – understanding ADO cursors – paging through a record set

**UNIT-V:**

Working with the command object – creating stored procedures – executing stored procedures with the connection object – executing stored procedures with the command object – retrieving parameter information.

**UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

**REFERENCES:**

1. Practical ASP – Ivan Bayross, BPB Publications, 2000
2. Scot Johnson, Using Active Server Pages, Prentice Hall of India Private Limited 2001.
3. Jones, A. Russell. Mastering Active Server Pages 3, SYBEX, 2000.
4. Dino Esposito, Programming ASP.NET Core, PHI Learning Pvt. Ltd., Microsoft Press, 2019
5. Ragupathi, Mugilan T. S. Learning ASP.NET Core MVC Programming, Packt Publishing, 2016.
6. Andreas Helland, Vincent Maverick Durano, Jeffrey Chilberto, Ed Price, ASP.NET Core 5 for Beginners, Packt Publishing, 2020.
7. Lock, Andrew, ASP.NET Core in Action, Manning, 2021.

**COURSE OUTCOMES:**

**CO1:** Acquire fundamentals of ASP.Net.

**CO2:** Understand the concepts of Components in ASP.Net.

**CO3:** Know about Cookies and Database Connectivity.

**CO4:** Write Applications using Connection Objects.

**CO5:** Implement the Concepts of Command Objects.

\*\*\*\*\*

# MAPPING

## CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

### CORE COURSE IV- ASP DOT NET (22SCC IT4)

PO CO	PO1	PO2	PO3	PO4	PO5
<b>22SCC IT4:1</b>	3	3	3	3	3
<b>22SCC IT4:2</b>	3	3	3	3	2
<b>22SCC IT4:3</b>	3	3	3	3	3
<b>22SCC IT4:4</b>	3	3	3	3	3
<b>22SCC IT4:5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3



**MAJOR BASED ELECTIVE I**  
**MULTIMEDIA SYSTEM (22SMBEIT1B)**

**UNIT - I:**

Multimedia Definition - Use Of Multimedia - Delivering Multimedia - Text: About Fonts and Faces - Using Text in Multimedia - Computers and Text - Font Editing and Design Tools - Hypermedia and Hypertext.

**UNIT - II:**

Images: Plan Approach - Organize Tools - Configure Computer Workspace - Making Still Images - Color - Image File Formats. Sound: The Power of Sound - Digital Audio - Midi Audio - Midi vs. Digital Audio - Multimedia System Sounds - Audio File Formats -Vaughan's Law of Multimedia Minimums - Adding Sound to Multimedia Project.

**UNIT - III:**

Animation: The Power of Motion - Principles of Animation - Animation by Computer - Making Animations that Work. Video: Using Video - Working with Video and Displays - Digital Video Containers - Obtaining Video Clips - Shooting and Editing Video.

**UNIT - IV:**

Making Multimedia: The Stage of Multimedia Project - The Intangible Needs - The Hardware Needs - The Software Needs - An Authoring Systems Needs- Multimedia Production Team.

**UNIT - V:**

Planning and Costing: The Process of Making Multimedia - Scheduling - Estimating - RFPs and Bid Proposals. Designing and Producing - Content and Talent: Acquiring Content - Ownership of Content Created for Project - Acquiring Talent.

**UNIT – VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

## **REFERENCES:**

1. Tay Vaughan, "Multimedia: Making It Work", 8th Edition, Osborne/McGraw- Hill, 2001.
2. Atul Puri, Tsuhan Chen, Multimedia Systems, Standards, and Networks, Taylor & Francis, 2000.
3. Rahman, Syed Mahbubur, Interactive Multimedia Systems, IRM Press, 2002.
4. Medioni, Gerard, and Havaladar, Parag. Multimedia Systems: Algorithms, Standards, and Industry Practices, Cengage Learning, 2009.
5. Borko Furht, Multimedia Systems and Techniques, Springer US, 2012.
6. Nahrstedt, Klara, and Steinmetz, Ralf, Multimedia Systems, Springer Berlin Heidelberg, 2013.

## **COURSE OUTCOMES:**

**CO1:** Identify the basics of multimedia and multimedia system architecture.

**CO2:** Understand different multimedia components.

**CO3:** Explain file formats for different multimedia components.

**CO4:** Describe various multimedia communication techniques.

**CO5:** Create animated applications

## MAPPING

### CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

#### **MAJOR BASED ELECTIVE I MULTIMEDIA SYSTEM (22SMBEIT1B)**

PO CO	PO1	PO2	PO3	PO4	PO5
<b>22SMBEIT1B :1</b>	2	3	3	3	2
<b>22SMBEIT1B:2</b>	2	3	3	3	2
<b>22SMBEIT1B:3</b>	2	3	3	3	2
<b>22SMBEIT1B:4</b>	2	3	3	3	2
<b>22SMBEIT1B :5</b>	2	3	3	3	2





**CORE COURSE IX**  
**MEAN STACK WEBAPP DEVELOPMENT (22SCCIT9)**

**THIRD YEAR**

**SEMESTER :VI**

**UNIT - I:**

Introducing Full Stack Development: Brief History of Web Development – Towards Full Stack Development – Benefits of Full Stack Development –MEAN Stack – Node.js: The Web Server/Platform – Express: The Framework – MongoDB: The Database – Angular JS: The Front End Framework. Designing a MEAN Stack Architecture: Common MEAN Stack Architecture – Designing a Flexible MEAN Architecture

**UNIT - II:**

Creating and Setting up MEAN Project: Creating an Express Project – Modifying Express for MVC – Import Bootstrap for Responsive Layouts. Static Site with Node and Express: Defining Routes in Express – Building Basic Controllers – Creating Some Views – Adding Rest of Views – Take Data out of Views and Make Smarter

**UNIT - III:**

Data Model with MongoDB: Connecting Express Application to MongoDB using Mongoose – Model the Data – Simple Mongoose Schema – MongoDB Shell to create MongoDB Database Writing REST API: Expose MongoDB database to Application: Setting up API in Express – GET Methods: Reading Data from Mongo DB – POST Methods: Adding Data to MongoDB. PUT Methods: Updating Data in MongoDB. DELETE Method: Deleting Data from MongoDB

**UNIT - IV:**

Consuming a REST API: Call API from Express – List of Data from an API – Getting Single Document from API – Adding Data to Database via API. Adding Angular Component to an Express Application: Getting and Running Angular – Displaying and Filtering the Homepage List – Getting Data from API – Ensuring Forms work as Expected

**UNIT - V:**

Single Page Application with Angular: Groundwork for an Angular SPA – Switch from Express Routing to Angular Routing – Adding First Views, Controllers and Services. Building SPA with Angular: Full SPA – Adding Additional Pages and dynamically injecting HTML – Complex Views and Routing Parameters – Angular UI Components to create Modal Popup

**UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned

**REFERENCES:**

1. Simon Holmes, “Getting MEAN with Mongo, Express, Angular, and Node, Manning Publications, 2016.
2. Jeff Dickey, “Write Modern Web Apps with the MEAN Stack: Mongo, Express, AngularJS, and Node.js”, Peachpit Press, 2015.
3. Brad Dayley, Brendan Dayley, “Node.js, MongoDB and Angular Web Development”, Addison Wesley, 2017.
4. Amos Q. Haviv, Adrian Mejia, ”Web Application Development with MEAN “, Kindle, June 15, 2017.

**COURSE OUTCOMES:**

**CO1:** Understand the fundamentals of Full Stack Development and MEAN Stack Architecture

**CO2:** Create and Setup a MEAN Project with Node and Express

**CO3:** Build a Data Model with Mongo DB using REST API

**CO4:** Demonstrate how to consume REST API

**CO5:** Ability to develop applications using AngularJS

## MAPPING

### CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

### **CORE COURSE IX MEAN STACK WEB APP DEVELOPMENT (22SCCIT9)**

PO CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCIT9:1</b>	2	3	3	3	3
<b>22SCCIT9:2</b>	2	3	1	2	2
<b>22SCCIT9:3</b>	2	3	3	3	2
<b>22SCCIT9:4</b>	2	3	3	3	2
<b>22SCCIT9:5</b>	2	2	3	3	3
<b>Average</b>	2	3	3	3	3



## **CORE PRACTICAL VI**

### **MEAN STACK WEB APP LAB (22SCCIT6P)**

**THIRD YEAR**

**SEMESTER:VI**

#### **JavaScript**

1. Document Object Model
2. JavaScript Frameworks – jQuery, AngularJS, Bootstrap

#### **Angular JS**

3. Directives, Expressions, Controllers and Filters
4. AngularJS Modules and Forms

#### **Node JS**

5. CallBacks, Events, Global Objects
6. Buffers, Streams and File System

#### **Express**

7. Express Framework
8. RESTful API

#### **MongoDB**

9. Data Modeling – Create Database, Drop Database
10. CRUD Operations
11. Document Querying and Functions

#### **Project**

12. Simple Web Application connecting component of MEAN Stack

#### **COURSE OUTCOMES:**

**CO1:** Execute Programs based on DOM and JavaScript Frameworks

**CO2:** Execute programs using basic functionality available in AngularJS and NodeJS

**CO3:** Demonstrate how to consume REST API using Express

**CO4:** Perform basic data access operations in MongoDB

**CO5:** Ability to develop simple web application connecting all the components of MEAN Stack

## MAPPING

### CO - PO – PSO matrices of course

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

**If there is no correlation, put “-“**

#### Core Practical – VI(22SCCIT6P)

PO CO	PO1	PO2	PO3	PO4	PO5
<b>22SCCIT6P:1</b>	3	3	3	3	3
<b>22SCCIT6P:2</b>	3	3	3	3	3
<b>22SCCIT6P:3</b>	3	3	3	3	3
<b>22SCCIT6P:4</b>	3	3	3	3	3
<b>22SCCIT6P:5</b>	3	3	3	3	3



**MAJOR BASED ELECTIVE II**  
**CYBER SECURITY (22SMBEIT2A)**

**THIRD YEAR**

**SEMESTER :VI**

**UNIT - I:**

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Internet Governance – Challenges and Constraints, Computer Criminals, CIA Triad, Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, etc., Comprehensive Cyber Security Policy.

**UNIT - II:**

Cyberspace and the Law & Cyber Forensics: Introduction, Cyber Security Regulations, Roles of International Law. The INDIAN Cyberspace, National Cyber Security Policy. Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Forensics Investigation, Challenges in Computer Forensics

**UNIT - III:**

Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Organizational security Policies and Measures in Mobile Computing Era, Laptops.

**UNIT - IV:**

Understanding Computer Forensics: Introduction - Historical Background of Cyberforensics - Digital Forensics Science - The Need for Computer Forensics - Cyberforensics and Digital Evidence - Forensics Analysis of E-Mail - Digital Forensics Life Cycle - Chain of Custody Concept - Network Forensics - Approaching a Computer Forensics Investigation - Setting up a Computer Forensics Laboratory: Understanding the Requirements - Computer Forensics and Steganography - Relevance of the OSI 7 Layer Model to Computer Forensics - Forensics and Social Networking Sites: The Security/Privacy Threats - Computer Forensics from Compliance Perspective - Challenges in Computer Forensics - Special Tools and Techniques - Forensics Auditing - Antiforensics.

## **UNIT - V:**

Forensics of Hand-Held Devices: Introduction - Understanding Cell Phone Working Characteristics - Hand-Held Devices and Digital Forensics - Toolkits for Hand-Held Device Forensics - Forensics of iPods and Digital Music Devices - An Illustration on Real Life Use of Forensics - Techno-Legal Challenges with Evidence from Hand-Held Devices - Organizational Guidelines on Cell Phone Forensics

## **UNIT - VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned

## **REFERENCES:**

1. Nina Godbole and Sunit Belpure, Cyber Security understanding Cybercrimes, Computer Forensics and legal perspectives, Wiley, 2011
2. Jennifer L. Bayuk, Jason Healey, Paul Rohmeyer, Marcus H. Sachs, Jeffrey, Cyber Security Policy Guide book, Wiley, 2012.
3. James Graham, Richard Howard and Ryan Otson, Cyber Security Essentials, CRC Press, 2013.
4. James Graham, Rick Howard, Ryan Olson, Cyber Security Essentials, CRC Press, 2016.
5. Mayank Bhushan, Rajkumar S Rathore, Aatif Jamshed, Fundamentals of Cyber Security. India, BPB Publications, 2017.
6. Anand Shinde, Introduction to Cyber Security: Guide to the World of Cyber Security, Notion Press, 2021.

## **COURSE OUTCOMES:**

**CO1:** Understand the basics of cyber security and cybercrime.

**CO2:** Understand and analyze cyber-attacks, types of cybercrimes, cyber laws

**CO3:** Know about cyber crime in Mobile and Wireless Devices

**CO4:** Know the basics of Computer Forensics

**CO5:** Understand about Forensics of Hand-Held Devices.

# MAPPING

## CO - PO Matrices of course

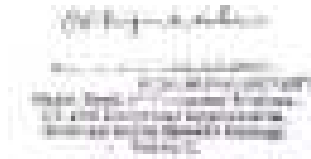
1: Slight (Low) 2: Moderate (Medium)

3: Substantial (High) If there is no correlation, put “-“

### MAJOR BASED ELECTIVE II

### CYBER SECURITY (22SMBEIT2A)

PO CO	PO1	PO2	PO3	PO4
<b>22SMBEIT2A:1</b>	3	3	3	3
<b>22SMBEIT2A:2</b>	3	3	3	3
<b>22SMBEIT2A:3</b>	3	3	3	3
<b>22SMBEIT2A:4</b>	3	3	3	3
<b>22SMBEIT2A:5</b>	3	3	3	3
<b>Average</b>	3	3	3	3





**MAJOR BASED ELECTIVE II**  
**CLOUD COMPUTING (22SMBEIT2B)**

**THIRD YEAR**

**SEMESTER : VI**

**UNIT - I:**

Cloud Computing Foundation: Introduction to Cloud Computing – Move to Cloud Computing – Types of Cloud – Working of Cloud Computing

**UNIT - II:**

Cloud Computing Architecture: Cloud Computing Technology – Cloud Architecture – Cloud Modeling and Design - Virtualization: Foundation – Grid, Cloud and Virtualization – Virtualization and Cloud Computing

**UNIT - III:**

Data Storage and Cloud Computing: Data Storage – Cloud Storage – Cloud Storage from LANs to WANs – Cloud Computing Services: Cloud Services – Cloud Computing at Work

**UNIT - IV:**

Cloud Computing and Security: Risks in Cloud Computing – Data Security in Cloud – Cloud Security Services – Cloud Computing Tools: Tools and Technologies for Cloud – Cloud Mashups – Apache Hadoop – Cloud Tools

**UNIT - V:**

Cloud Applications – Moving Applications to the Cloud – Google Cloud Applications – Amazon Cloud Services – Cloud Applications

**UNIT - VI Current Contours (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

## REFERENCES:

1. A. Srinivasan and J.Suresh, “Cloud Computing – A Practical Approach for Learning and Implementation”, Pearson India Publications, 2014. (**Unit 1:** Chapter1, Chapter2, Chapter3, Chapter4; **Unit 2:** Chapter5, Chapter6, Chapter7, Chapter8, Chapter9, Chapter10; **Unit 3:** Chapter11, Chapter12, Chapter13, Chapter14, Chapter16, Chapter17; **Unit 4:** Chapter18, Chapter19, Chapter20, Chapter24, Chapter25, Chapter26,Chapter27; **Unit 5:** Chapter28, Chapter30, Chapter31, Chapter32)
2. Rajkumar Buyya, James Broberg, Andrzej, “Cloud Computing: Principles and Paradigms”, Wiley India Publications, 2011.
3. Anthony T.Velte , Toby J. Velte Robert Elsenpeter, “Cloud computing a practical approach”, TATA McGraw- Hill , New Delhi – 2010
4. Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online” - Que 2008
5. Judith Hurwitz , Robin Bloor , Marcia Kaufman ,Fern Halper, “Cloud computing for dummies”, Wiley Publishing, Inc, 2010
6. Comer, Douglas, The Cloud Computing Book: The Future of Computing Explained, CRC Press, 2021.

## COURSE OUTCOMES:

- CO1:** Describe various types of cloud
- CO2:** Identify the cloud computing basics and its architecture
- CO3:** Implement data storage and security
- CO4:** Explore various cloud applications
- CO5:** Describe various cloud services.

# MAPPING

## CO - PO Matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

### MAJOR BASED ELECTIVE II CLOUD COMPUTING (22SMBEIT2B)

PO CO	PO1	PO2	PO3	PO4	PO5
22SMBEIT2B:1	3	3	3	3	3
22SMBEIT2B:2	3	3	3	3	3
22SMBEIT2B:3	3	3	3	3	3
22SMBEIT2B:4	3	3	3	3	3
22SMBEIT2B:5	3	3	3	3	3
<b>Average</b>	3	3	3	3	3





# **SHRIMATI INDIRA GANDHI COLLEGE**

(Affiliated to Bharathidasan University)

Nationally Accredited at 'A' Grade (3<sup>rd</sup> Cycle) by NAAC | An ISO 9001 : 2015 Certified Institution

Tiruchirappalli - 620 002

## **CO, PO MAPPING**

**ACADEMIC YEAR 2022-2023**

**PG: COMPUTER SCIENCE/INFORMATION TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE, IT & COMPUTER  
APPLICATIONS**

**SHRIMATI INDIRA GANDHI COLLEGE**

(Affiliated to Bharathidasan University)

(Nationally Accredited at A Grade (3<sup>rd</sup> Cycle) by NAAC)

An ISO:9001-2015 Certified Institution

Tiruchirappalli 620 002

**DEPARTMENT OF COMPUTER SCIENCE, IT & COMPUTER APPLICATIONS**

**M.Sc Computer Science/M.Sc Information Technology**

**Programme Outcome in Science (PO)**

**PO1:** Practice and grow as computing professionals, conducting research and/or leading, designing, developing, or maintaining projects in various technical areas of computer science.

**PO2:** Drives scientific and societal advancement through technological innovation and entrepreneurship.

**PO3:** To enable the students, to understand the core concepts, visualize and to apply them in the real time scenarios.

**PO4:** An ability to apply knowledge of computing and mathematics appropriate to the discipline.

**PO5:** An ability to design, implement, and evaluate a computational system to meet desired needs within realistic constraints.

# **SEMESTER-I**

## **SYLLABUS: P22CSCC11 - Core Course – I (CC)**

### **Mathematical Foundation for Computer Science**

**UNIT - I MATRICES:** Determinants, inverse of matrix. System of equations, Linear transformation - rank and nullity, Consistency and inconsistency of linear system of equations, rank nullity theorem, Echelon form of a matrix, and Row reduced echelon form of matrix. Eigen values and Eigen vectors.

**UNIT – II POWER METHOD TO FIND THE DOMINANT EIGEN VALUES, NUMERICAL LINEAR ALGEBRA:** Gauss elimination method, Gauss Jordan Method, Jacobi Method for solving linear systems.

**UNIT – III SETS:** Operations on sets, Venn Diagrams, Multi Sets, Binary Relations, Equivalence Relations, Ordering Relations, Operations on Relations, Partial Orders . Statements and Notation, Connectives, Quantified Propositions, Logical Inferences, Methods of Proof of an Implication, First Order Logic and other Methods of Proof, Rules of Inference for Quantified Propositions, Proof by Mathematical Induction.

**UNIT – IV GENERATING FUNCTIONS OF SEQUENCES:** Calculating Coefficients of Generating Functions, Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, the Method of Characteristic Roots, Solutions of Inhomogeneous Recurrence Relations

**UNIT – V INTRODUCTION TO PROBABILITY:** Random variables - discrete and continuous, probability functions, density and distribution functions, mean and variance, special distributions (Binomial, Hyper geometric, Poisson, Uniform, exponential and normal). Testing of Hypothesis, Null and alternative hypothesis, level of significance, one-tailed and two tailed tests, tests for small samples- T-test, Chi-square test.

## REFERENCES:

1. Kenneth H. Rosen, “Discrete Mathematics And Its Applications”, 7th Ed, Mc Graw Hill, 2012.
2. Erwin Kreyszig, “Advanced Engineering Mathematics”, Wiley India, 9th Edition 2011.
3. Bernard Kolman, Robert Busby and Sharon Cutler Ross, “Discrete Mathematical Structures for Computer Science”, 6 th Ed, PHI, 2013.
4. Walpole, R. E., Myers, R. H., Myers S L & Keying Ye, ‘Probability and Statistics for Engineers and Scientists’. 8th ed, Pearson Education, 2007.
5. Eric Lehman, F. Thomson Leighton, Albert R. Meyer, “Mathematics for Computer Science”, MIT 7th Ed, 2015
6. William Stein, “Elementary Number Theory: Primes, Congruences, and Secrets”: A Computational Approach Springer, 2008.
7. Sipser, “Introduction to the Theory of Computation, CENGAGE Learning, 2014. 4. Ernest Davis, “Linear Algebra and Probability for Computer Science Applications “, 1st Edition, CRC Press 2012.
8. Tom M. Apostol, “Introduction to Analytic Number Theory”, Springer, 1998

## COURSE OUTCOME

- CO1.** Apply the basis of the mathematical applications.
- CO2.** Apply iterative methods (Gauss Jordan, Gauss Elimination and Jacobi) to solve systems of linear equations.
- CO3.** Understand Propositions, tautologies and inference rules.
- CO4.** Use sets and operations on sets.

**CO5.** Formulate problems and apply testing of hypothesis.

**MAPPING**

**CO - PO matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

**P22CSCC11 - Core Course – I (CC) - Mathematical Foundation for Computer Science**

<b>CO \ PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22CSCC11.1</b>	3	3	3	3	3
<b>P22CSCC11.2</b>	3	3	2	2	2
<b>P22CSCC11.3</b>	3	3	2	3	2
<b>P22CSCC11.4</b>	3	3	2	2	2
<b>P22CSCC11.5</b>	3	3	3	3	2
<b>Average</b>	3	3	3	3	2

*(Signature)*  
 Head, Dept. of Computer Science,  
 The Catholic College,  
 Thrissur-680008.



## **M.Sc Computer Science**

### **P22CSCC12 - Core Course – II (CC)–Problem Solving Using Python and R**

#### **UNIT – 1 INTRODUCTION TO PYTHON:**

Introduction – Python overview – Getting started – Comments – Python identifiers – Reserved keywords – Variables – Standard data types – Operators – Statements and Expressions – String operations – Boolean expressions. Control Statements: The for loop – while statement – if-elif-else statement – Input from keyboard. Functions: Introduction – Built-in functions – User defined functions – Function Definition – Function Call - Type conversion – Type coercion – Python recursive function.

#### **UNIT – II STRINGS:**

Strings –Compound data type – len function – String slices – String traversal – Escape characters – String formatting operator – String formatting functions. Tuples: Tuples – Creating tuples – Accessing values in tuples – Tuple assignment – Tuples as return values – Basic tuple operations – Built-in tuple functions. Lists: Values and accessing elements – Traversing a list – Deleting elements from list – Built-in list operators & methods. Dictionaries: Creating dictionary – Accessing values in dictionary – Updating dictionary – Deleting elements from dictionary – Operations in dictionary - Built-in dictionary methods.

#### **UNIT – III FILES AND EXCEPTIONS:**

Introduction to File Input and Output - Writing Structures to a File - Using loops to process files Processing Records - Exception. Classes and Objects in Python: Overview of OOP – Data encapsulation – Polymorphism – Class definition – Creating objects – Inheritance – Multiple inheritances – Method overriding – Data encapsulation – Data hiding.

#### **UNIT – IV DATA MANIPULATION TOOLS & SOFTWARES:**

Numpy: Installation - Narray - Basic Operations -Indexing, Slicing, and Iterating - Shape Manipulation - Array Manipulation - Structured Arrays -Reading and Writing Array Data on Files. Pandas: The pandas Library: An Introduction - Installation -Introduction to pandas Data

Structures - Operations between Data Structures - Function Application and Mapping - Sorting and Ranking - Correlation and Covariance - —Not a Number Data - Hierarchical Indexing and Leveling – Reading and Writing Data: CSV or Text File - HTML Files – Microsoft Excel Files.

#### **UNIT – V PROGRAMMING WITH R:**

Variables - Vector, matrix, arrays – List – Data Frames – Functions – Strings – Factors – Loops – Packages –Date and Time – Files - Making packages.

#### **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

#### **REFERENCES:**

1. Python: The Complete Reference, Matrin C Brown, McGraw-Hill, 2018.
2. Python Programming a Modular Approach with Graphics, Database, Mobile, and Web Applications – SheetalTaneja, Naveen Kumar – Pearson Publication, 2018.
3. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, Wes McKinny, 2nd Edition,O’Reilly Media, 2017.
4. Data Analytics Using Python, Bharti Motwani, Wiley, 2020
5. Richard Cotton, “Learning R”, O’Reilly, 2013
6. Python for Everybody: Exploring Data Using Python3, Dr. Charles R. Severance, 2016.
7. E Balagurusamy, —Introduction to computing and problem solving using Python||, McGraw Hill Publication,2016.
8. Mark Summerfield, Programming in Python 3: A Complete Introduction to the Python Language, 2nd Ed.,Addison-Wesley Professional, 2010.
9. Mark Lutz, —Learning Python||, 5th Ed., 2013.
10. Welsey J. Chun, —Core Python Programming||, Prentice Hall, 2001

11. <https://realpython.com/python-practice-problems/>
12. <https://freepdf-books.com/impractical-python-projects-playful-programming-activities-to-make-you-smarter-book-of-2019/>
13. [https://freepdf-books.com/fundamentals-of-python-first-programs-second-edition-book-of-2019](https://freepdf-books.com/fundamentals-of-python-first-programs-second-edition-book-of-2019/)
14. <https://docs.python.org>
15. <https://www.learnpython.org/> 16. <https://www.javatpoint.com/python-tutorial>
17. <https://www.tutorialspoint.com/r/index.htm>

**COURSE OUTCOME:**

**CO1:** Write Python programs using Python data structures

**CO2:** Develop object oriented programs in Python

**CO3:** Manipulate files using Python

**CO4:** Apply the Python libraries NumPy and Pandas for problem solving

**CO5:** Write R programs for data visualization.

## MAPPING


### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### **P22CSCC12 - Core Course – II (CC) Problem Solving Using Python and R**

<b>CO \ PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22CSCC12 :1</b>	3	2	3	3	2
<b>P22CSCC12 :2</b>	3	2	3	3	3
<b>P22CSCC12 :3</b>	3	2	2	3	3
<b>P22CSCC12 :4</b>	3	3	3	3	3
<b>P22CSCC12 :5</b>	3	2	3	3	3
<b>Average</b>	3	2	3	3	3

  
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## **P22CSCC1A - Core Choice Course – I (CCC) –Advanced Java Programming**

### **UNIT – I DESIGN PATTERNS:**

Design Patterns: Introduction to Design patterns - Catalogue for Design Pattern - Factory Method Pattern, Prototype Pattern, Singleton Pattern- Adapter PatternProxy Pattern-Decorator Pattern- Command Pattern- Template Pattern- Mediator Pattern-Collection Framework – Array List class – Linked List class – Array List vs. Linked List - List Iterator interface - Hash Set class- Linked Hash Set classTree Set class Priority Queue class - Map interface-Hash Map class-Linked Hash Map class –Tree Map class - Comparable interface -Comparator interface Comparable vs. Comparator

### **UNIT – II APPLETS AND AWT:**

Applet Fundamentals- Applet Class - Applet lifecycle- Steps for Developing Applet Programs- Passing Values through Parameters- Graphics in Applets- GUI Application - Dialog Boxes - Creating Windows - Layout Managers – AWT Component classes – Swing component classes- Borders – Event handling with AWT components - AWT Graphics classes - File Choosers - Color Choosers – Tree – Table –Tabbed panels–Progressive bar - Sliders.

### **UNIT – III JDBC AND JAVA NETWORKING:**

JDBC -Introduction - JDBC Architecture - JDBC Classes and Interfaces – Database Access with MySQL -Steps in Developing JDBC application - Creating a New Database and Table with JDBC - Working with Database Metadata; Java Networking Basics of Networking - Networking in Java- Socket Program using TCP/IP - Socket Program using UDP- URL and Inet address classes.

## **UNIT – IV SERVLETS AND JSP:**

Servlet: Advantages over Applets - Servlet Alternatives - Servlet Strengths - Servlet Architecture - Servlet Life Cycle – Generic Servlet, Http Servlet - First Servlet - Invoking Servlet - Passing Parameters to Servlets - Retrieving Parameters - Server-Side Include – Cookies- JSP Engines - Working with JSP - JSP and Servlet - Anatomy of a JSP Page- Database Connectivity using Servlets and JSP. 9

## **UNIT – V INTERFACE:**

Lambda Expressions- Method Reference- Functional Interface- Streams API, Filters- Optional Class- Nashorn- Base 64 Encode Decode- JShell(RPEL)- Collection Factory Methods- Private Interface Methods- Inner Class Diamond Operator- Multiresolution Image API.

## **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

## **REFERENCES:**

1. Bert Bates, Karthy Sierra, Eric Freeman, Elisabeth Robson, “Head First Design Patterns”, O’REILLY Media Publishers.(1st-Unit).
2. Herbert Schildt, “Java: A Beginner Guide”, Oracle Pres-Seventh Edition. (2nd and 3rd Unit).
3. Murach’s, “Java Servlets and JSP”, 2nd Edition, Mike Murach & Associates Publishers; 3rd Edition. (4th Unit).
4. Warburton Richard, “Java 8 Lambdas”, Shroff Publishers & Distributors Pvt Ltd. (5th Unit).
5. Paul Deitel and Harvey Deitel, “Java: How to Program”, Prentice Hall Publishers; 9th Edition.
6. Jan Graba, “An Introduction to Network Programming with Java-Java 7 Compatible”, 3rd Edition, Springer.
7. <https://www.youtube.com/watch?v=Ae-r8hsbPUo>
8. <https://enos.itcollege.ee/~jpoial/allalaadimised/reading/Advanced-java.pdf>

9. <https://www.udemy.com/course/advanced-java-programming/>

10. <https://www.edureka.co/blog/advanced-java-tutorial>

**COURSE OUTCOME:**

**CO1:** Understand the design patterns

**CO2:** Develop a Graphical User Interface (GUI) with Applet.

**CO3:** Develop a Client-Server Application with Database Maintenance.

**CO4:** Develop a program using Servlet and JSP.

**CO5:** Develop programs that use interfaces. Work on search engine, JSP Engines,

**MAPPING CO - PO matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

**P22CSCC1A - Core Choice Course – I (CCC)–ADVANCED JAVA PROGRAMMING**

<b>CO \ PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22CSCC1A:1</b>	3	3	3	3	3
<b>P22CSCC1A:2</b>	3	3	3	3	3
<b>P22CSCC1A:3</b>	3	3	3	3	3
<b>P22CSCC1A:4</b>	3	3	3	3	3
<b>P22CSCC1A:5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3

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**P22CSE1A/P22ITE3A- Core Elective – I/III (CE)**

**SEMESTER I/SEMESTER III**

**Web Services**

**UNIT – I OVERVIEW OF DISTRIBUTED COMPUTING:**

Introduction to web services – Industry standards, Technologies and concepts underlying web services – their support to web services. Applications that consume web services.

**Unit – II XML:**

Its choice for web services – network protocols to back end databasetechnologies – SOAP, WSDL – exchange of information between applications in distributed environment – locating remote web services – its access and usage. UDDI specification – an introduction.

**UNIT – III OUTLINE OF WEB SERVICES:**

Conversation – static and interactive aspects of system interface and its implementation, work flow – orchestration and refinement, transactions, security issues – the common attacks – security attacks facilitated within web services quality of services – Architecting of systems to meet users requirement with respect to latency, performance, reliability, QOS metrics, Mobile and wireless services – energy consumption, network bandwidth utilization, portals and services management.

**UNIT – IV APPLICATION USING WEB SERVICES:**

Building real world enterprise applications using web services – sample source codes to develop web services – steps necessary to build and deploy web services and client applications to meet customer s requirement – Easier development, customization, maintenance, transactional requirements, seamless porting to multiple devices and platforms.

## **UNIT – V TOMCAT AND AXIS SOAP SERVER:**

Deployment of Web services and applications onto Tomcat application server and axis SOAP server (both are free wares) – Web services platform as a set of enabling technologies for XML based distributed computing.

## **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

## **REFERENCES:**

1. Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services: An Architects Guide, Prentice Hall, Nov 2003.
2. Heather Williamson, “XML: The Complete Reference “Tata McGraw-Hill Education India.
3. Martin Kalin, “Java Web Services: Up and Running”, O’Reilly Publishers.
4. [https://en.wikipedia.org/wiki/Web\\_service](https://en.wikipedia.org/wiki/Web_service)
5. [https://www.tutorialspoint.com/webservices/what\\_are\\_web\\_services.htm](https://www.tutorialspoint.com/webservices/what_are_web_services.htm)
6. <https://www.javatpoint.com/what-is-web-service>

## **COURSE OUTCOME:**

**CO1:** Understand the design principles and application of SOAP and REST based web services.

**CO2:** Understand XML concepts.

**CO3:** Design collaborating web services according to a specification.

**CO4:** Implement an application that uses multiple web services in a realistic business scenario.

**CO5:** Use industry standard open source tools such as Apache Axis2, Tomcat, Derby and Eclipse to build, test, deploy and execute web services and web applications that consume them.

## MAPPING


### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

#### **P22CSE1A -Core Elective I -Web Services**

<b>PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO</b>					
<b>P22CSE1A:1</b>	3	2	3	3	2
<b>P22CSE1A:2</b>	3	2	3	3	2
<b>P22CSE1A:3</b>	3	2	2	1	2
<b>P22CSE1A:4</b>	3	3	3	3	3
<b>P22CSE1A:5</b>	3	2	3	3	2
<b>Average</b>	3	2	3	3	2

  
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**P22CSVAC1/P22ITCC22 – Value Added Course – I (VAC)/ Core Course IV (CC)**

**Security in Computing/Foundations of Information Security**

**SEMESTER I/SEMESTER II**

**UNIT – I INTRODUCTION AND BASIC CONCEPTS:** Threats, vulnerabilities, controls; risk; Breaches; confidentiality, integrity, availability; Attacks, Exploits. Information Gathering (Social Engineering, Foot Printing & Scanning). Open Source/ Free/ Trial Tools: nmap, zenmap, Port Scanners, Network scanners.

**UNIT – II EXPLANATION OF MALWARE, TYPES OF MALWARE:** Virus, Worms, Trojans, Rootkits, Robots, Adware's, Spywares, Ransom wares, Zombies etc., , Malware Analysis. Open Source/ Free/ Trial Tools: Antivirus Protection, Anti Spywares, System tuning tools, Anti Phishing.

**UNIT – III SECURITY IN CONVENTIONAL OPERATING SYSTEMS:** Memory, time, file, object protection requirements and techniques Identification and authentication. Trusted operating systems.

**UNIT – IV DATABASE MANAGEMENT SYSTEMS SECURITY:** Database integrity, Database secrecy , Inference control , Multilevel databases.

**UNIT – V NETWORK SECURITY:** Network threats: eavesdropping, spoofing, modification, denial of service attacks, Introduction to network security techniques: firewalls, intrusion detection systems. Cyber crimes and control measures.

**UNIT – VI CURRENT CONTOURS** (For continuous internal assessment only):  
Contemporary Developments Related to the Course during the Semester Concerned

## REFERENCES:

1. Charles P. Pfleeger, Shari Lawrence Pfleeger, Jonathan Margulies, Security in Computing”, 5 th Ed, Prentice hall, 2015.
2. Michael E. Whitman, ‘Information Security: incident response and disaster recovery’, Cengage Learning, 2009
3. WM. Arthur Conklin, Gregory B. White, Chuck Cotheren, Dwayne Williams, Roger Lavis, “Principles of Computer Security”, 4 th Ed, Mc Graw Hill 2016
4. <https://www.w3schools.com/cybersecurity/index.php>
5. <https://www.javatpoint.com/cyber-security-tools>

## COURSE OUTCOME:

**CO1:** Understand the basic concepts of information security – Threats, Vulnerabilities and Controls.

**CO2:** Examine various malwares and program flaws.

**CO3:** Compare Security enabled in conventional and trusted operating systems.

**CO4:** Acquire the knowledge about attacks

**CO5:** Understand Malicious Code and Activity

**MAPPING**

**CO - PO matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

**P22CSVAC1 /P22ITCC22– Value Added Course – I (VAC) – Security in Computing/Foundation of Information Security**

<b>CO \ PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22CSVAC1/ P22ITCC22 :1</b>	2	2	3	3	2
<b>P22CSVAC1/P22ITCC22:2</b>	2	2	1	3	3
<b>P22CSVAC1/ P22ITCC22 :3</b>	3	2	2	3	2
<b>P22CSVAC1/P22ITCC22:4</b>	3	2	3	3	3
<b>P22CSVAC1/ P22ITCC22 :5</b>	3	2	3	3	3
<b>Average</b>	3	2	3	3	3

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**SYLLABUS: P22CSCC21 /P22ITCC12 - Core Course – III(CC)**

**Advanced Database Management System**

**SEMESTER II/SEMESTER I**

**UNIT–I RELATIONAL AND PARALLEL DATABASE DESIGN:**

Basics, Entity Types, Relationship Types, ER Model, ER-to-Relational Mapping algorithm. Normalization: Functional Dependency, 1NF, 2NF, 3NF, BCNF, 4NF and 5NF. Architecture, I/O Parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism, Interoperation Parallelism.

**UNIT–II DISTRIBUTED AND OBJECT BASED DATABASES:**

Architecture, Distributed data storage, Distributed transactions, Commit protocols currency control, Query Processing. Complex Data Types, Structured Types and Inheritance, Table Inheritance, array and Multiset, Object Identity and Reference Types, Object Oriented versus Object Relational.

**UNIT–III SPATIAL DATABASE:**

Spatial Database Characteristics, Spatial Data Model, Spatial Database Queries, Techniques of Spatial Database Query, Logic based Databases: Introduction, Overview, Propositional Calculus, Predicate Calculus, Deductive Database Systems, Recursive Query Processing

**UNIT–IV XML DATABASES:**

XML Hierarchical data model, XML Documents, DTD, XML Schema, XML Querying ,XHTML, Illustrative Experiments

## **UNIT–V TEMPORAL DATABASES:**

Introduction, Intervals, Packing and Unpacking Relations, Generalizing the relational Operators, Database Design, Integrity Constraints, Multimedia Databases: Multimedia Sources, Multimedia Database Queries, Multimedia Database Applications.

## **UNIT–VI: CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned.

## **REFERENCES:**

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", 6th edition, McGraw-Hill International Edition, 2011
2. C.J. Date, A. Kannan, S. Swamynathan, "An Introduction to Database Systems", 8th Edition, Pearson Education Reprint 2016
3. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", Pearson, 7th edition 2016.
4. Thomas Connolly, Carolyn Begg., "Database Systems a practical approach to Design, Implementation and Management", Pearson Education, 2014.
5. <https://www.geeksforgeeks.org/normal-forms-in-dbms/>
6. <https://www.simplilearn.com/tutorials/sql-tutorial/what-is-normalization-in-sql>
7. <https://www.tutorialspoint.com/Spatial-Databases>
8. <https://www.oracle.com/database/spatial/>
9. <https://nptel.ac.in/courses/106/106/106106093/>



**COURSE OUTCOME:**

At the end of the course, the students will be able to:

**CO1:**

Acquired knowledge for developing holistic solutions based on database systems/data ase techniques.

**CO2:** Normalize relational database design of an application

**CO3:** Critically assess new developments in database technology

**CO4:** Know about the Various Data models and Works on Database Architecture

**CO5:** Interpret and explain the impact of emerging database standards

## MAPPING


### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### Advanced Database Management Systems(P22ITCC12/P22CSCC21)

CO \ PO	PO				
	PO1	PO2	PO3	PO4	PO5
P22ITCC12/P22CSCC21 : 1	3	3	3	3	3
P22ITCC12/ P22CSCC21 : 2	3	3	3	3	3
P22ITCC12/P22CSCC21:3	3	3	3	3	3
P22ITCC12/P22CSCC21:4	3	3	3	3	3
P22ITCC12/P22CSCC21:5	3	3	3	3	3
Average	3	3	3	3	3

  
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**P22CSCC2B - Core Choice Course – II (CCC)–Mobile Application Development  
SEMESTER II**

**UNIT–I INTRODUCTION TO MOBILE APPLICATIONS:**

Native and web applications - Mobile OS and Databases. Introduction to Android: History-Features–OSS–OHA-Versions-Android devices- Setting up software–IDE. Introduction to iOS–iOS features–user interface-Using Wifi– iPhone marketplace.

**UNIT–II ANDROID ARCHITECTURE:**

Android Stack-Linux Kernel-Android Runtime-Dalvik VM-Application Framework- Android emulator - Android applications development -Virtualization–APIs– Android File system–A Basic Android Application- Deployment. Android Activities: The Activity Lifecycle– Life cycle methods – Creating Activity.

**UNIT–III INTENTS:**

Intent Filters–Activity stack. Android Services: Simple services– Binding and Querying the service– Executing services. Broadcast Receivers: Creating and managing receivers– Receiver intents. Content Providers: Creating and using content providers– Content resolver.

**UNIT–IV ANDROID UI:**

Android Layouts–Attributes–Layout styles-Linear–Relative–Table–Grid–Frame – Menus - Lists and Notifications - Input Controls: Buttons - Text Fields –Checkboxes- alert dialogs–Spinners-rating bar-progress bar.

**UNIT–V WORKING WITH DATABASES:**

SQLite–coding for SQLite using Android- Publishing and Internationalizing

mobile applications- mobile application deployment: Game, Clock, Calendar, Converter, Phonebook.

**UNIT–VI CURRENT CONTOURS(For continuous internal Assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

**REFERENCES:**

1. BarryBurd,“AndroidApplicationDevelopment–All-in-oneforDummies”,2ndEdition,WileyIndia,2016.
2. LaurenDarcey,ShaneConder,“SamsTeachYourselfAndroidApplicationDevelopmentin24hours”,2ndedition,PearsonEducation,2013.
3. Jerome (J. F) DiMarzio, “Android – A Programmer’s Guide”, McGrawHillEducation,8threprint,2015.
4. DavidMark,JackNutting,JeffLaMarcheandFredericOlsson,“BeginningiOS6Development: ExploringtheiOS SDK”,Apress,2013.
5. <http://www.developer.android.com>

## **COURSEOUTCOME:**

On completion of the course the student will be able to:

**CO1:** Understand the features and challenges of mobile devices.

**CO2:** Know the differences between native app development, web app development and hybrid app development

**CO3:** Apply the UI components, multimedia usage, permissions, Storage usage,

**CO4:** Understand and apply the UI design for the given problem

**CO5:** Design an application based on the user requirements

## MAPPING


### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### **P22CSCC2B - Core Choice Course – II (CCC)–Mobile Application Development**

<b>CO \ PO</b>					
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22CSCC2B : 1</b>	3	3	-	3	3
<b>P22CSCC2B : 2</b>	3	3	3	3	-
<b>P22CSCC2B :3</b>	3	3	-	3	-
<b>P22CSCC2B :4</b>	3	3	3	3	-
<b>P22CSCC2B :5</b>	3	3	3	3	-
<b>Average</b>	3	3	3	3	3

  
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## SEMESTER-I

### P22IT11 - Core Course– I (CC)–Object Oriented Systems Development

**UNIT – I FUNDAMENTALS OF OOSD:** Overview of Object Oriented Systems

Development: Two orthogonal view of the software - OOSD methodology - Object basics:

Object Oriented Philosophy Objects – Attributes – Object respond to messages – Encapsulation and information hiding – class hierarchy – Polymorphism – Object relationship and associations.

OOSD life cycle: Software development process – OOSD Use case Driven Approach – Reusability.

**UNIT – II METHODOLOGY, MODELLING AND UML:** Object Oriented Methodologies:

Rumbaugh et al.'s object modelling technique – The Booch methodology – The Jacobson et al.

methodology – Patterns – Frameworks - The Unified approach. Unified Modelling Language :

Static and dynamic models – UML diagrams – UML class diagram – Use case diagram - UML dynamic modelling – packages and model organization.

**UNIT – III OBJECT ORIENTED ANALYSIS:** Object Oriented Analysis process: Business

Object Analysis - Use case driven - object oriented analysis – Business process modelling – Use-

Case model – Developing effective documentation. Classification: Classifications theory –

Approaches for identifying classes – Noun phrase approach – Common class patterns approach –

Use-Case Driven approach – Classes, Responsibilities, and Collaborators - Naming classes.

Identifying object relationships, attributes, and methods: Association – Super-Sub class

relationship – Aggregation – Class responsibility – Object responsibility.

**UNIT – IV OBJECT ORIENTED DESIGN:** Object Oriented Design Process and Design

Axioms - OOD process- OOD axioms – Corollaries – Design patterns. Designing classes:

Designing classes – Class visibility – Refining attributes – Designing methods and protocols –

Packages and managing classes. Access layer: Object Store and persistence – DBMS – Logical and physical Database Organization and access control – Distributed Databases and Client Server Computing — Multi database Systems – Designing Access layer classes. View Layer: Designing view layer classes – Macro level process – Micro level process – The purpose of view layer interface – Prototyping the user interface. 5

**UNIT – V SOFTWARE QUALITY:** Software Quality Assurance: Quality assurance tests – Testing strategies – Impact of Object Orientation on Testing - Test Cases- Test Plan – Continuous testing. System Usability and Measuring User satisfaction: Usability Testing – User satisfaction test – A tool for analyzing user satisfaction. System Usability and Measuring User satisfaction: Introduction – Usability Testing.

**UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):** Contemporary Developments Related to the Course during the Semester Concerned.

**REFERENCES:** 1. Ali Bahrami, “Object Oriented Systems Development using UML”, McGrawHill, 2008 2. Booch Grady, Rumbaugh James, Jacobson Ivar,

“The Unified modeling Language – User Guide, Pearson Education, 2006 3. Brahma Dathan, SarnathRamnath,

“Object Oriented Analysis, Design and Implementation”, Universities Press, 2010. 4. Mahesh P.Matha, “Object-Oriented Analysis and Design Using UML”, PHI Learning Private Limited, 2012. 5. RachitaMisra, Chhabi Rani Panigrahi, Bijayalaxmi Panda, “Principles of Software Engineering and System Design”, Yesdee Publishing 2019. 6.

[https://www.tutorialspoint.com/object\\_oriented\\_analysis\\_design/ooad\\_object\\_oriented\\_system.html](https://www.tutorialspoint.com/object_oriented_analysis_design/ooad_object_oriented_system.html)

7. <https://www.w3computing.com/systemsanalysis/object-oriented-systemsanalysis-design/> 8. <https://www.geeksforgeeks.org/steps-to-analyze-and-design-objectoriented-system>

### **Course Outcome**

At the end of the course, the students will be able to:

1. Show how the object-oriented approach differs from the traditional approach to systems analysis and design.
2. Analyze, design, document the requirements through use case driven approach
3. Explain the importance of modelling and how the Unified Modelling Language (UML) represents an object-oriented system using a number of modeling views.



4. Recognize the difference between various object relationships: inheritance, association and aggregation.
5. Show the role and function of test cases, testing strategies and test plans in developing object-oriented software.

**COURSE – I: OBJECT ORIENTED ANALYSIS AND DESIGN(P22ITCC11)**

**MAPPING**


**CO - PO matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“**M.Sc., INFORMATION TECHNOLOGY**

**COURSE – I: OBJECT ORIENTED SYSTEMS DEVELOPMENT(P22ITCC11)**

<b>PO</b> CO	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22ITCC11:1</b>	3	2	3	2	3
<b>P22ITCC11:2</b>	3	2	1	1	2
<b>P22ITCC11:3</b>	3	2	2	2	1
<b>P22ITCC11:4</b>	3	2	2	3	2
<b>P22ITCC11:5</b>	2	3	3	2	1
<b>Average</b>	3	2	2	2	2

  
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## **P22ITCC1B – Core Choice Course– I (CCC)–Advanced Data Structures (P22ITCC1B)**

### **SYLLABUS**

#### **UNIT–I: INTRODUCTION:**

Arrays–Singly Linked List–Circularly Linked List – Stack – Queues – List  
Abstract Data Type (ADT)–Iterators–GraphsandSorting1-Graphs: Graph ADT–  
Data Structures for Graphs–Graph Traversals– Directed Acyclic Graphs –  
Shortest Paths–Minimum Spanning Tree-Sorting: Merge Sort– Quick Sort–  
Selection Sort.

#### **UNIT–II: HASHING:**

General Idea, Hash Function, Separate Chaining, Hash Tables without linked lists:  
Linear Probing, Quadratic Probing, Double Hashing, Rehashing, Hash Tables in  
the Standard Library, Universal Hashing, Extendible Hashing.

#### **UNIT–III: PRIORITY QUEUES(HEAPS):**

Model, Simple implementations, Binary Heap: Structure Property, Heap Ord er  
Property, Basic Heap Operations: insert, delete, Percolate down, Other Heap  
Operations.

#### **UNIT–IV: TREES:**

AVL: Single Rotation, Double Rotation, B-Trees. **Multi-way Search  
Trees**– Trees: Searching for an Element in reinserting a New Element in a Tree,  
Deleting an Element from a Tree. Red-Black Trees – Properties of red-black trees,  
Rotations, Insertion, Deletion.

#### **UNIT–V:GRAPHSALGORITHMS:**

Elementary Graph Algorithms: Topological sort, Single Source Shortest Path Algorithms: Dijkstra's, Bellman-Ford, All-Pairs Shortest Paths: Floyd- Warshall's Algorithm.

**UNIT-VI: CURRENT CONTOURS(For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned.

**REFERENCCESS:**

1. Mark Alleneis, Data Structure sand Algorithm Analysis in C++, Mark Allen Weiss, 4th Edition, 2014, Pearson.
2. Thomas HCormen, CharlesE. Leiserson, RonaldL. Rivest, CliffordS Tein, Introduction to Algorithms, 3rd Edition, 2009, The MIT Press.
3. Ellis Horowitz, Satraj Sahani and Rajasekharam, Fundamentals of Computer Algorithms, 2nd Edition, 2009, University Press Pvt. Ltd.
4. Reema Thareja, S. Rama Sree, Advanced Data Structures, Oxford University Press, 2018.
5. <http://www.coursera.org/learn/advanced-data-structures>
6. <http://ocw.mit.edu/6-851S12> (MIT OPEN COURSEWARE, Massachusetts Institute of Technology)
7. <https://nptel.ac.in/courses/106/106/106106133/>
8. <https://www.mooc-list.com/search/node?Keys=Advanced+Data+Structures>
9. <http://freevideolectures.com/Course/2279/Data-Structures-And-Algorithms>

**Course Outcome**

1. Understand the implementation of symbol table using hashing techniques
2. Develop and analyse algorithms for red-black trees, B-trees and Splay trees
3. Develop algorithms for text processing applications
4. Students would be able to work on disjoint sets of data structures.
5. Identify suitable data structures and develop algorithms for computational problems.

## MAPPING


### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### ADVANCED DATA STRUCTURES(P22ITCC1B)

PO CO	PO1	PO2	PO3	PO4	PO5
<b>P22ITCC12 :1</b>	3	2	3	2	3
<b>P22ITCC12 :2</b>	3	2	1	1	2
<b>P22ITCC12:3</b>	3	2	2	2	1
<b>P22ITCC12 :4</b>	3	2	2	3	2
<b>P22ITCC12 :5</b>	3	2	2	2	2

  
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**SEMESTER I/SEMESTER II**  
**P22ITE1C/AP22CSE2C– Core Elective Course– I & II (CCC)–Green Computing**

**SYLLABUS**

**UNIT – I GREEN IT: AN OVERVIEWS:**

Introduction, Environmental Concerns and Sustainable Development, Environmental Impacts of IT, Green IT, Holistic Approach to Greening IT, Greening IT, Applying IT for enhancing Environmental sustainability, Green IT Standards and Eco-Labeling of IT, Enterprise Green IT strategy, Green IT: Burden or Opportunity

**UNIT – II GREEN DEVICES AND HARDWARE WITH GREEN SOFTWARE:**

Green Devices and Hardware: Introduction, Life Cycle of a device or hardware, Reuse, Recycle and Dispose. Green Software: Introduction, Energy-saving software techniques, Evaluating and Measuring software Impact to platform power.

**UNIT – III GREEN ENTERPRISES AND THE ROLE OF IT:**

Introduction, Organization and Enterprise Greening, Information systems in Greening Enterprises, Greening Enterprise: IT Usage and Hardware, Inter-Organizational Enterprise activities and Green Issues, Enablers and making the case for IT and Green Enterprise.

**UNIT – IV MANAGING GREEN IT:**

Introduction, Strategizing Green Initiatives, Implementation of Green IT, Information Assurance, Communication and Social media.

## **UNIT – V REGULATING THE GREEN IT:**

Laws, Standards and Protocols Introduction, The regulatory environment and IT manufacturers, Non regulatory government initiatives, Industry associations and standards bodies, Green building standards, Green data centers, Social movements and Greenpeace.

### **REFERENCES:**

1. Harnessing Green IT Principles and Practices , San Murugesan, G.R.

Gangadharan Wiley Publication, ISBN:978812653968020

2. The Green Computing Book - Tackling Energy Efficiency at Large Scale,  
WuchunFeng, CRC Press, 2014

3. <https://www.javatpoint.com/green-computing>

4. <https://dl.acm.org/doi/fullHtml/10.1145/3493700.3493772>

### **COURSE OUTCOME:**

**At the end of the course, the students will be able to:**

CO1: Understand Green IT with its different dimensions and Strategies.

CO2: Gain the Knowledge about Green devices and hardware along with its green software methodologies.

CO3: Understand the concepts of how to manage the green IT with necessary components.

CO4: Know the various laws, standards and protocols for regulating green IT.

CO5: Identify the various key sustainability and green IT trends.

## MAPPING

### CO - PO matrices of course


1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

**M.Sc Information Technology/ M.Sc Computer Science**

**P22ITE1C /P22CSE2C– Core Elective Course– I & II (CCC)–Green Computing**

<b>PO</b> <b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22ITE1C5/ P22CSE2C:1</b>	3	2	3	2	3
<b>P22ITE1C5/ P22CSE2C:2</b>	3	2	2	3	2
<b>P22ITE1C5/ P22CSE2C:3</b>	3	2	3	2	2
<b>P22ITE1C5/ P22CSE2C:4</b>	3	2	2	3	3
<b>P22ITE1C5/ P22CSE2C:5</b>	3	2	3	2	2
<b>Average</b>	3	2	3	3	3

  
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## **P22ITCC 21– Core Course Course– III (CC)–Advanced Operating Systems**

### **SYLLABUS**

**UNIT – I MULTIPROCESSOR OPERATING SYSTEMS:** System Architectures- Structures of OS – OS design issues –Process synchronization – Process Scheduling and Allocation- memory management.

**UNIT – II DISTRIBUTED OPERATING SYSTEMS:** System Architectures- Design issues – Communication models –clock synchronization – mutual exclusion – election algorithms- Distributed Deadlock detection.

**UNIT – III DISTRIBUTED SCHEDULING:** Distributed shared memory - Distributed File system – Multimedia file systems - File placement – Caching

**UNIT – IV DATABASE OPERATING SYSTEMS:** Requirements of Database OS – Transaction process model – Synchronization primitives - Concurrency control algorithms

**UNIT – V MOBILE OPERATING SYSTEMS:** ARM and Intel architectures - Power Management - Mobile OS Architectures - Underlying OS - Kernel structure and native level programming – Runtime issues Approaches to power management

**UNIT – VI CURRENT CONTOURS** (For continuous internal assessment only): Contemporary Developments Related to the Course during the Semester Concerned. REFERENCES: 1. Mukesh Singhal and Niranjana G. Shivaratri, “Advan



## **REFERENCES:**

1. Mukesh Singhal and Niranjan G. Shivaratri, “Advanced Concepts in Operating Systems Distributed, Database, and Multiprocessor Operating Systems”, Tata McGraw-Hill, 2001.
2. A S Tanenbaum, Distributed Operating Systems, Pearson Education Asia, 2001. 24
3. Source Wikipedia, Mobile Operating Systems, General Books LLC, 2010.
4. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "Operating System Concepts", Wiley, Eighth Edition, 2008.
5. <https://www.javatpoint.com/distributed-operating-system>
6. <https://www.w3schools.in/operating-system/distributed-system>
7. <https://www.blogsaays.com/tutorial-part1-introduction-android-mobileoperating-system/>
8. <https://www.geeksforgeeks.org/scheduling-and-load-balancing-indistributed-system/>

## **Course Outcome (CO)**

CO1:Enrich the Knowledge about advance concepts in OS.

CO2:Demonstrate the various issues in distributed operating systems.

CO3:Identify the different features of data base operating systems.

CO4:Able to develop modules for Mobile devices.

CO5:Able to develop OS for distributed operating system.

## MAPPING

### CO - PO matrices of course


1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### M.Sc INFORMATION TECHNOLOGY

### ADVANCED OPERATING SYSTEMS(P22ITCC21)

PO CO	PO1	PO2	PO3	PO4	PO5
<b>P22ITCC21 :1</b>	3	3	2	3	3
<b>P22ITCC21 :2</b>	3	3	3	1	2
<b>P22ITCC21 :3</b>	3	3	3	2	1
<b>P22ITCC21 :4</b>	3	3	3	3	2
<b>P22ITCC21 :5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	2

  
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## **P22ITCC2B– Core Choice Course– II (CCC)–Data Mining Technologies and Tools**

**UNIT – I INTRODUCTION TO DATA MINING:** Mining from database - Data mining functionalities – Mining patterns - Classification of data mining systems - Major issues in Data mining.

**UNIT – II DATA PREPROCESSING:** Need for preprocessing – Data summarization – Data cleaning – Data integration - Data transformation – Data reduction – Data discretization. Association Rule Mining: Apriori algorithm.

**UNIT – III CLASSIFICATION:** Decision trees - Naïve Bayes - K Nearest Neighbour - Support Vector Machine - Neural Networks- Deep Neural Networks- Evaluation of classification algorithms. Prediction – Regression, Evaluation of Prediction methods.

**UNIT – IV CLUSTERING:** Cluster Analysis - Partitioning Methods: K-Means, K-Medoids - Hierarchical Methods – BIRCH, ROCK - Density based methods: DBSCAN, OPTICS - Evaluation of clustering algorithms. Data Visualization: Foundations for building visualizations - Visualizing data -Working with Data in Tableau - Moving from Foundational to Advanced Visualizations.

**UNIT – V ADVANCED DATA MINING TECHNIQUES:** Mining Data Streams - Mining Time Series Data - Mining Sequence Patterns in Biological Data - Graph Mining - Social Network Analysis – Spatial Data Mining - Multimedia Data Mining - Text Mining - Mining the World Wide Web - Data Mining Applications and Tools.

**UNIT – VI CURRENT CONTOURS** (For continuous internal assessment only):  
Contemporary Developments Related to the Course during the Semester Concerned. 30

### **REFERENCES:**

1. Jaiwei Han, MichelineKamber (2006). Data Mining-concepts and techniques, 2/e, Morgan Kaufmann Publishers, San Francisco.
2. Joshua N.Milligan (2015). Learning Tableau, PACKT publishing
3. Mark A. Hall, Ian H. Witten, Eibe Frank (2011),Data Mining: Practical Machine Learning Tools and Techniques, 4/e, Morgan Kaufmann Publishers, San Francisco .

4. David Hand, Heikki Mannila and Padhraic Smyth (2001). Principles of Data Mining, Prentice Hall of India, New Delhi
5. Arun K. Pujari (2001). Data Mining Techniques; Universities Press, Hyderabad
6. Soman KP (2005). Data mining from theory to practice, 2/e, PHI Learning Pvt. Ltd., New Delhi.
7. Dr. K. Meena & N. Vijayalakshmi, Introduction to Data Mining, P.R. Publishers and Distributors, Tiruchirappalli, 2014 (ISBN:978-81-927413-1-4)
8. <https://www.javatpoint.com/data-mining-techniques>
9. <https://www.tutorialride.com/data-mining/data-mining-tutorial.htm>
10. <https://www.javatpoint.com/classification-algorithm-in-machine-learning>
11. <https://developers.google.com/machine-learning/clustering>

### **Course Outcome (CO)**

**CO1:** Develop a data mining application for data analysis using various tools

**CO2:** Apply preprocessing statistical methods for any given raw data

**CO3:** Evaluate systematically supervised and unsupervised models and algorithms w.r.t their accuracy

**CO4:** Develop practical work of Data mining techniques and design hypothesis based on the analysis to conceptualize a Data mining solution to a practical problem

**CO5:** Characterize and discriminate data summarization forms and determine data mining functionalities

**CO6:** Discover and measure interesting patterns from different kinds of databases

## MAPPING

### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)


If there is no correlation, put “-“

### M.Sc(Information Technology)

### CORE CHOICE COURSE II : DATA MINING TECHNIQUES AND TOOLS

### SUBJECT CODE: P22ITCC2B

PO CO	PO1	PO2	PO3	PO4	PO5
P22ITCC2B. 1	3	2	3	2	2
P22ITCC2B. 2	3	2	1	2	3
P22ITCC2B. 3	3	2	2	2	2
P22ITCC2B. 4	3	2	2	3	3
P22ITCC2B. 5	2	3	3	3	3
P22ITCC2B. 6	2	3	2	3	2
Average	3	3	2	3	3

  
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## **P22ITCCE2C– Core Elective– II (CE)–Internet of Things**

### **SYLLABUS**

#### **UNIT–I: INTRODUCTION TO IoT:**

Internet of Things–Physical Design of IoT–Logical Design of IoT:Blocks, Models  
- IoT Enabling Technologies: Wireless Sensor Networks, Cloud Computing, Big Data Analytics, Communication Protocols,Embedded Systems.IoT Levels and Deployment Templates–Domain Specific IoTs.

#### **UNIT–II:INTRODUCTIONTOARDUINO:**

Installing the Integrated Development Environment ( IDE)- Setting up the Arduino Board-Structuring an Arduino Program-Simple Primitive Types-Floating-Point Numbers–Working with groups of values- Arduino String Functionality – Character Strings- Converting Number to String– Structuring the Code into Function Block.

#### **UNIT–III: SERIALCOMMUNICATION:**

Sending Debug Information from Arduino to your computer – Sending Formatted Text and Numeric data from Arduino-Receiving Serial Data in Arduino – Sending and Receiving multiple text fields from Arduino in a single message. Digital and Analog Input: Using Switch-Without external resistors- detecting the closing of switch- How long a switch is pressed- reading a Keypad, Analog values- Changing range of values- DisplayingVoltageupto5V.

#### **UNIT–IV: INPUTSFROMSENSORS:**

Detecting Movements, Light, Motion–Measuring Distance, Temperature- Detecting Vibration, Sound – Reading RFID tags. Visual Output: Connecting and Using LEDs-Adjusting the Brightness of an LED- DrivingHigh-power LEDs-Adjusting the colour of an

LED. Physical Output: Controlling the position of a servo-  
Controlling one or Two Servo with a Potentiometer or sensor-  
Controlling the speed of continuous Rotation Servos.

#### **UNIT-V: AUDIOOUTPUTS:**

Playing Tones, Simple Melody- Generating more than one  
simultaneously Tone-Generating Audio Tones and Fading LED's,  
Playing WAV File, Controlling MIDI. Using Display: Connecting  
and Using a Text LCD Display- Formatting Text-Turning the cursor  
and display On or Off-Scrolling Text- Displaying Special Symbols-  
Creating Custom Characters- Displaying Symbols Larger than a  
single character- Displaying Text on TV. Using Time and Dates:  
Creating Delays-Using

Mills to determine duration-Measuring duration Pulse- Using  
Arduino as Clock-Creating an alarm to periodically call a function-  
Using a Real time clock

#### **UNIT-VI-CURRENT CONTOURS(For continuous internal assessmentonly):**

Contemporary Developments Related to the Course during  
the SemesterConcerned.

#### **REFERENCES:**

1. ArshdeepBahaga,VijayMadiseti(2014).“InternetofThings–  
Ahandsonapproach”,UniversitiesPress
2. MichaelMargolis(2011),“ArduinoCookbook”2ndEdition,O'ReillyMedia
3. HonboZhou(2012).TheInternetofThingsintheCloud:AMiddlewarePe  
rspective,NewYork:CRCPress.
4. Dieter Uckelmann, Mark Harrison, Florian Michahelles (2011).  
ArchitectingtheInternetofThings,Germany,Springer.

5. Olivier Hersent, Omar Elloumi and David Boswarthick (2012). The Internet of Things: Applications to the Smart Grid and Building Automation, United States: Wiley Publishing Inc
6. <https://data-flair.training/blogs/iot-tutorial/>
7. <https://www.arduino.cc/en/Tutorial/HomePage/>
8. <https://fiware-tutorials.readthedocs.io/en/1.0.0/iot-sensors/>

### **COURSE OUTCOME:**

**At the end of the course, the students will be able to:**

**CO1:** Understand basic concepts of IoT.

**CO2:** Apply various sensors and protocols in real time applications.

**CO3:** Implement data acquisition using Arduino.

**CO4:** Create real time applications

**CO5:** Create web application for handling data communication using IoT devices.



## MAPPING


### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### M.Sc. INFORMATION TECHNOLOGY(P22ITCCE2C)

PO \ CO	PO1	PO2	PO3	PO4	PO5
P22ITE2C5.1	3	3	3	3	3
P22ITE2C 5.2	3	2	2	3	2
P22ITE2C 5.3	3	2	3	2	2
P22ITE2C 5.4	3	2	3	3	3
P22ITE2C 5.5	3	2	3	2	2
Average	3	2	3	3	3

  
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## **SEMESTER -III**

### **Core Course V (CC) Big Data Analytics (P22CS31)**

#### **UNIT – I INTRODUCTION TO BIG DATA:**

Data, Characteristics of data and Types of digital data: Unstructured, Semi structured and Structured, Sources of data, Working with unstructured data, Evolution and Definition of big data, Characteristics and Need of big data, Challenges of big data, Data environment versus big data environment

#### **UNIT – II BIG DATA ANALYTICS:**

Overview of business intelligence, Data science and Analytics, Meaning and Characteristics of big data analytics, Need of big data analytics, Classification of analytics, Challenges to big data analytics, Importance of big data analytics, Basic terminologies in big data environment

**UNIT – III BIG DATA TECHNOLOGIES AND DATABASES:** Introduction to NoSQL, Uses, Features and Types, Need, Advantages, Disadvantages and Application of NoSQL, Overview of NewSQL, Comparing SQL, NoSQL and NewSQL, Introduction to MongoDB and its needs, Characteristics of MongoDB, Introduction of apache cassandra and its needs, Characteristics of Cassandra

**UNIT – IV HADOOP FOUNDATION FOR ANALYTICS:** History, Needs, Features, Key advantage and Versions of Hadoop, Essential of Hadoop ecosystems, RDBMS versus Hadoop, Key aspects and Components of Hadoop, Hadoop architectures

**UNIT – V MAPREDUCE AND YARN FRAMEWORK:** Introduction to MapReduce, Processing data with Hadoop using MapReduce, Introduction to YARN, Components, Need and Challenges of YARN, Dissecting YARN, MapReduce application, Data serialization and Working with common serialization formats, Big data serialization formats

**UNIT – VI CURRENT CONTOURS** (For continuous internal assessment only):  
Contemporary Developments Related to the Course during the Semester Concerned 43

#### **REFERENCES:**

1. Seema Acharya and Subhashini Chellappan, “Big Data and Analytics”, Wiley India Pvt. Ltd., 2016

2. “Big Data” by Judith Hurwitz, Alan Nugent, Dr. Fern Halper and Marcia Kaufman, Wiley Publications, 2014.
3. “Big Data Imperatives: Enterprise Big Data Warehouse, BI Implementations and Analytics” by Soumendra Mohanty, Madhu Jagadeesh and Harsha Srivatsa, Apress Media, Springer Science + Business Media New York, 2013
4. Mining of Massive Datasets”, Anand Rajaraman, Jure Leskovec, Jeffery D. Ullman, Springer, July 2013.
5. “Hadoop: The definitive Guide”, Tom White, O'Reilly Media, 2010.
6. <https://www.techtarget.com/searchbusinessanalytics/definition/big-dataanalytics>
7. [https://www.sas.com/en\\_us/insights/analytics/big-data-analytics.html](https://www.sas.com/en_us/insights/analytics/big-data-analytics.html)

**COURSE OUTCOME:**

Upon completion of the course, the student are expected to:

1. Understand the big data environment
2. Understand the concepts of analytics
3. Understand the unstructured databases.
4. Analyze the Big Data framework like Hadoop and NOSQL to efficiently store and process Big Data to generate analytics.
5. Reveal the MapReduce technologies.

## MAPPING


### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### **P22CSCC31 - Core Course –V (CC) – Big Data Analytics**

<b>CO \ PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22CSCC31 :1</b>	3	2	3	3	2
<b>P22CSCC31 :2</b>	3	2	3	3	3
<b>P22CSCC31 :3</b>	3	2	2	3	3
<b>P22CSCC31 :4</b>	3	3	3	3	3
<b>P22CSCC31 :5</b>	3	2	3	3	3
<b>Average</b>	3	2	3	3	3

  
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## **Core Course VI: P22ITCC32 – Problem Solving Using R**

### **SYLLABUS**

#### **UNIT - I OVERVIEW OF R:**

History and Overview of R- Basic Features of R-Design of the R System Installation of R- Console and Editor Panes- Comments- Installing and Loading R Packages- Help Files and Function Documentation- Saving Work and Exiting R Conventions- R for Basic Math- Arithmetic- Logarithms and Exponentials- E Notation- Assigning Objects- Vectors- Creating a Vector- Sequences, Repetition, Sorting, and Lengths- Sub setting and Element Extraction- Vector-Oriented Behaviour Practical

#### **UNIT - II MATRICES AND ARRAYS:**

Defining a Matrix – Defining a Matrix- Filling Direction- Row and Column Bindings- Matrix Dimensions- Sub setting- Row, Column, and Diagonal Extractions- Omitting and Overwriting- Matrix Operations and Algebra- Matrix Transpose- Identity Matrix- Matrix Addition and Subtraction- Matrix Multiplication- Matrix Inversion-Multidimensional Arrays- Subsets, Extractions, and Replacements

#### **UNIT - III NON-NUMERIC VALUES:**

Logical Values- Relational Operators- Characters- Creating a String Concatenation- Escape Sequences- Substrings and Matching- Factors Identifying Categories- Defining and Ordering Levels- Combining and Cutting UNIT - IV LISTS AND DATA FRAMES: Lists of Objects-Component Access-Naming-Nesting-Data Frames-Adding Data Columns and Combining Data Frames-Logical Record Subsets-Some Special Values-Infinity-NaN-NA-NULL Attributes-Object-Class-Is-Dot Object-Checking Functions-As-Dot Coercion Functions

#### **UNIT – V BASIC PLOTTING:**

Using plot with Coordinate Vectors-Graphical Parameters-Automatic Plot Types Title and Axis Labels Color-Line and Point Appearances-Plotting Region Limits Adding Points, Lines, and Text to an Existing Plot-ggplot2 Package-Quick Plot with qplot-Setting Appearance Constants with Geoms--  
READING AND WRITING FILES- R-Ready Data Sets- Contributed Data Sets- Reading in External Data Files- Writing Out Data Files and Plots- Ad Hoc Object Read/Write Operations

**UNIT – VI CURRENT CONTOURS** (For continuous internal assessment only): Contemporary

Developments Related to the Course during the Semester Concerned.

**REFERENCES:**

1. Tilman M. Davies, “The Book of R - A First Programming and Statistics” Library of Congress Cataloging-in-Publication Data,2016.
2. Roger D. Peng, ”R Programming for Data Science”Lean Publishing, 2016.
3. Hadley Wickham, Garrett Grolemund, ” R for Data Science”,OREILLY Publication,2017
4. Steven Keller, “R Programming for Beginners”, CreateSpace Independent Publishing Platform 2016.
5. Kun Ren ,”Learning R Programming”, Packt Publishing,2016
6. <https://www.geeksforgeeks.org/r-programming-exercises-practice-questionsand-solutions/>
7. [https://www.w3schools.com/r/r\\_graph\\_plot.asp](https://www.w3schools.com/r/r_graph_plot.asp)
8. <https://www.geeksforgeeks.org/list-of-dataframes-in-r/>

**COURSE OUTCOME (CO)**

- CO1: Identify and execute basic syntax and programs in R.
- CO2: Perform the Matrix operations using R built in functions
- CO3: Apply non numeric values in vectors
- CO4: Create the list and data frames
- CO5: Exploit the graph using ggplot2.

## MAPPING

### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### **P22ITCC32 - Core Course –VI (CC) - Problem Solving Using R**

<b>PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO</b>					
<b>P22ITCC32:1</b>	3	2	3	3	2
<b>P22ITCC32:2</b>	3	2	3	3	3
<b>P22ITCC32:3</b>	2	2	3	2	2
<b>P22ITCC32:4</b>	3	2	3	3	1
<b>P22ITCC32:5</b>	2	2	2	3	2
<b>Average</b>	3	2	3	3	2

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## **SYLLABUS: P22ITCC3P - Core Practical –III (CP)**

### **Problem Solving using R Lab**

1. Develop program for Basic Mathematical computation –Square, Square root, exponential etc.
2. Develop program to extract the first and last elements of already created vector from, storing them as a new object.
3. Develop program Overwrite the existing object using the same sequence with the order reversed.
4. Develop program Confirm that the length of the vector created is 20.
5. Create and store a three-dimensional array with six layers of a 4 X 2 matrix, filled with a decreasing sequence of values between 4.8 and 0.1 of the appropriate length.
6. Extract and store as a new object the fourth- and first-row elements, in that order, of the second column only of all layers of (1).
7. Confirm the specific locations of elements equal to 0 in the 10 X 10 identity matrix I10
8. Create and store this data frame as dframe with the fields of person, sex, funny in your R workspace. Append the two new records.
9. Use your knowledge of handling character strings in R to extract all records from mydataframe that correspond to people whose names start with S.
10. Create a database with the fields of weight, height and sex then create a plot of weight on the x-axis and height on the y-axis. Use different point characters or colors to distinguish between males and females and provide a matching legend. Label the axes and give the plot a title.

### **Course Objectives (CO)**

CO1: Use R Programming Language in R Studio IDE to perform basic tasks on Basic Mathematical Computation –Square, Square root, exponential etc.

CO2: The objective of this module to make students exercise to provide fundamental concept of statistical analysis in R environment.

CO3: Install, Code and Use R Programming Language in R Studio IDE to perform basic tasks on Vectors, Matrices and Data frames.

CO4: To make students exercise non numeric values in vectors in R environment.

CO5: Install, Code and Use R Programming Language in R Studio IDE to perform list operations.



**MAPPING**

**CO - PO matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

**P22ITCC3P - Core Practical –III (CP) - Problem Solving Using R Lab**

CO \ PO	PO	PO1	PO2	PO3	PO4	PO5
<b>P22ITCC3P:1</b>		3	2	3	3	2
<b>P22ITCC3P:2</b>		3	2	3	3	3
<b>P22ITCC3P:3</b>		2	2	3	2	2
<b>P22ITCC3P:4</b>		3	2	3	3	1
<b>P22ITCC3P:5</b>		2	2	2	3	2
Average		3	2	3	3	2

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## **P22CSCC32 - Core Course – VI (CC)–Artificial Intelligence and Machine Learning**

### **UNIT – I INTRODUCTION TO MACHINE LEARNING:**

Introduction ,Components of Learning , Learning Models , Geometric Models, Probabilistic Models, Logic Models, Grouping and Grading, Designing a Learning System, Types of Learning, Supervised, Unsupervised, Reinforcement, Perspectives and Issues, Version Spaces, PAC Learning, VC Dimension.

### **UNIT – II SUPERVISED AND UNSUPERVISED LEARNING:**

Decision Trees: ID3, Classification and Regression Trees, Regression: Linear Regression, Multiple Linear Regression, Logistic Regression, Neural Networks: Introduction, Perception, Multilayer Perception, Support Vector Machines: Linear and Non-Linear, Kernel Functions, K Nearest Neighbors. Introduction to clustering, K-means clustering, K-Mode Clustering.

### **UNIT – III ENSEMBLE AND PROBABILISTIC LEARNING:**

Model Combination Schemes, Voting, Error-Correcting Output Codes, Bagging: Random Forest Trees, Boosting: Adaboost, Stacking. Gaussian mixture models - The Expectation-Maximization (EM) Algorithm, Information Criteria, Nearest neighbour methods - Nearest Neighbour Smoothing, Efficient Distance Computations: the KD-Tree, Distance Measures.

### **UNIT – IV REINFORCEMENT LEARNING AND EVALUATING HYPOTHESES:**

Introduction, Learning Task, Q Learning, Non deterministic Rewards and actions, temporal-difference learning, Relationship to Dynamic Programming, Active reinforcement learning, Generalization in reinforcement learning. Motivation, Basics of Sampling Theory: Error Estimation and Estimating Binomial Proportions, The Binomial Distribution, Estimators, Bias, and Variance

### **UNIT – V INTRODUCTION OF AI:**

Definition of AI- AI Problems – Underlying Assumption – AI technique – Level of the Model - Criteria for Success. Problems, Problem Spaces, Search: Defining the Problem as State Space Search - Production Systems -

problem Characteristics – Production System Characteristics

## **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

### **REFERENCE BOOKS:**

1. Ethem Alpaydin, "Introduction to Machine Learning", MIT Press, Prentice Hall of India, 3rd Edition 2014.
2. Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar "Foundations of Machine Learning", MIT Press, 2012.
3. Tom Mitchell, "Machine Learning", McGraw Hill, 3rd Edition, 1997.
4. MACHINE LEARNING - An Algorithmic Perspective, Second Edition, Stephen Marsland, 2015.
5. Stuart J. Russell and Norvig, Artificial Intelligence – A Modern Approach, Second Edition, Pearson Education, 2007
6. Elaine Rich, Kevin Knight, Shivashankar B Nair, Artificial Intelligence, Third Edition, Tata McGraw-Hill Education Private Limited, Seventh Reprint 2011.
7. K.Meena & R.Dhanapal, Artificial Intelligence and Expert Systems, International Books, Tlruclhrappalll, 2001. (ISBN :81 - 900811 - 1 - x)
8. Charu C. Aggarwal, "Data Classification Algorithms and Applications", CRC Press, 2014.
9. Charu C. Aggarwal, "DATA CLUSTERING Algorithms and Applications", CRC Press, 2014.
10. Kevin P. Murphy "Machine Learning: A Probabilistic Perspective", The MIT Press, 2012
11. Vinod Chandra S.S and Anand Hareendran S., Artificial Intelligence and Machine Learning, PHI Learning Private Limited, 2014
12. <https://www.analyticsinsight.net/the-difference-between-artificial-intelligence-and-machine-learning/>
13. <https://marutitech.com/artificial-intelligence-and-machine-learning/>

### **COURSE OUTCOME**

1. Recognize the characteristics of Machine Learning techniques that enable to solve real world problems
2. Recognize the characteristics of machine learning strategies.
3. Apply various supervised learning methods to appropriate problems
4. Identify and integrate more than one techniques to enhance the performance of learning
5. Understand basic AI Techniques

## MAPPING


### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### **P22CSCC32 - Core Course –VI (CC) - Artificial Intelligence and Machine Learning**

<b>PO</b> <b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22CSCC32 :1</b>	3	3	3	2	3
<b>P22CSCC32 :2</b>	3	3	3	2	3
<b>P22CSCC32 :3</b>	3	3	3	2	3
<b>P22CSCC32 :4</b>	3	3	3	3	3
<b>Average</b>	3	3	3	2	3

  
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## **P22ITCC3A - Core Course – III(CC)– DISTRIBUTED TECHNOLOGIES**

### **DISTRIBUTED TECHNOLOGIES**

#### **UNIT – I INTRODUCTION TO DISTRIBUTED COMPUTING:**

Challenges involved in establishing remote connection – Strategies involved in remote computation – Current Distributed computing practices through Dot Net and Java technologies.

#### **UNIT – II ADVANCED ADO.NET:**

Disconnected Data Access – Gridview, Details View, Form View controls – Crystal Reports – Role of ADO, NET in Distributed Applications.

#### **UNIT – III ADVANCED ASP.NET:**

AdRotator, Multiview, Wizard and Image Map Controls – Master Pages – Site Navigation – Web Parts – Uses of these controls and features in Website development.

#### **UNIT – IV ADVANCED FEATURES OF ASP.NET:**

Security in ASP, NET – State Management in ASP, NET – Mobile Application development in ASP, NET – Critical usage of these features in Website development.

#### **UNIT – V WEB SERVICES:**

Role of Web services in Distributed Computing – WSDL, UDDI, SOAP concepts involved in Web Services – Connected a Web Service to a Data Base – Accessing a Web Service through in ASP, NET application.

#### **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned.

#### **REFERENCES:**

1. Walther, ASP, NET 3.5, SAMS Publication, 2005.
2. Mathew Mac Donald, “ASP.NET Complete Reference”, TMH 2005.
3. Crouch Matt J, “ASP.NET and VB.NET Web Programming”, Addison Wesley 2002.
4. J.Liberty, D.Hurwitz, “Programming ASP.NET”, Third Edition, O’REILLY, 2006.

5. K.Meena, R.Sivakumar, A.B.Karthick Anand Babu, Dot Net Technologies,Himalaya Publishing  
House Pvt., Ltd., Bangalore, 2016, (ISBN:978 -93-5037-938-9)
6. <https://www.geeksforgeeks.org/types-of-distributed-system/>
7. <https://www.dotnetcurry.com/tutorials/aspnet>
8. <https://www.javatpoint.com/ado-net-tutorial>

**COURSE OUTCOME:**

**CO1:** Design a web page with Web form fundamentals and web control classes

**CO2:** Knowledge on Various Controls in ASP .NET

**CO3:** Enrich the knowledge of ASP.NET object, ADO.NET data access

**CO4:** Analyze and Design the Mobile Application Development in ASP .NET

**CO5:** Clear Understanding on WSDL, UDI and SOAP Concepts

**MAPPING**

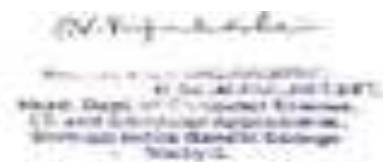
**CO - PO matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

**P22ITCC3A - Core Course – III (CC) DISTRIBUTED TECHNOLOGIES**

CO \ PO	PO				
	PO1	PO2	PO3	PO4	PO5
<b>P22ITCC3A :1</b>	3	2	3	3	2
<b>P22ITCC3A :2</b>	3	2	3	3	3
<b>P22ITCC3A :3</b>	3	2	2	3	3
<b>P22ITCC3A :4</b>	3	3	3	3	3
<b>P22ITCC3A :5</b>	3	2	3	3	3
Average	3	2	3	3	3



## **P22CSCC3B - CRYPTOGRAPHY AND NETWORK SECURITY**

**UNIT – I COMPUTER NETWORK SECURITY CONCEPTS:** Computer Security Concepts –The OSI Security Architecture – Security Attacks – Security Services – Security Mechanisms – Fundamental Security Design Principles – Attack Surfaces and Attack Trees – A model for Network Security.

**UNIT – II CLASSICAL ENCRYPTION TECHNIQUES:** Symmetric Cipher Model – Substitution Techniques – Transportation Techniques – Rotor Machines – Steganography. Block Ciphers and the Data Encryption Standard: Traditional Block Cipher Structure – The Data Encryption Standard (DES) – A DES example – The strength of DES – Block Cipher Design Principles.

**UNIT – III ADVANCED ENCRYPTION STANDARD:** Finite Field of Arithmetic – AES Structure – AES Transformation Functions – AES key Expansion – An AES Example – AES Implementation. Block Cipher Operation: Multiple Encryption and Triple DES – Electronic Code Book – Cipher Block Chaining mode – Cipher Feedback Mode – Output Feedback Mode – Counter Mode.

**UNIT – IV PUBLIC KEY CRYPTOGRAPHY AND RSA:** Principles of Public Key Cryptosystems – The RSA Algorithm. Other Public key Cryptosystems: Diffiehell man Key Exchange – Elgamal Cryptographic System – Elliptic Curve Arithmetic – Elliptic Curve Cryptography – Secure Hash Algorithm (SHA).

**UNIT – V WIRELESS NETWORK SECURITY:** Wireless Security – Mobile Device Security – IEEE 802.11 Wireless LAN Overview – IEEE 802.11 Wireless LAN Security. Electronic Mail Security.

### **REFERENCES:**

1. William Stallings. Cryptography and Network Security. Uttar Pradesh: Pearson India Education Services Pvt. Ltd, 2018.
2. Behrouz A. Forouzan and Debdeep Mukhopadhyay. Cryptography and Network Security. New Delhi: Tata McGraw Hill Education Private Limited, 2011.
3. AtulKahate. Cryptography and Network Security. New Delhi: Tata McGraw Hill Education Private Limited, 2010.



## **COURSE OUTCOME**

**CO1.** Remember the terminologies used in security

**CO2.** Learn the encryption techniques

**CO3** Understand the various advanced encryption techniques..

**CO4.** Know the public key cryptography techniques

**CO5.** Understand wireless network security

## MAPPING

### CO - PO matrices of course


1: Slight (Low) 2: Moderate (Medium) 3:

Substantial (High) If there is no correlation,

put “-“

### **P22CSCC3B- CRYPTOGRAPHY AND NETWORK SECURITY**

<b>CO \ PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22CSCC3B 8:1</b>	3	3	3	3	3
<b>P22CSCC3B :2</b>	3	3	2	3	3
<b>P22CSCC3B :3</b>	3	3	3	3	2
<b>P22CSCC3B :4</b>	3	3	2	3	2
<b>P22CSCC3B :5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3

  
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**ELECTIVE COURSE III**  
**BLOCK CHAIN TECHNOLOGY**  
**P22CSE3B**

**UNIT – 1            INTRODUCTION TO BLOCKCHAIN:**

Distributed DBMS – Limitations of Distributed DBMS, Introduction to Block chain – History, Definition, Distributed Ledger, Blockchain Categories – Public, Private, Consortium, Blockchain Network and Nodes, Peer-to-Peer Network, Mining Mechanism, Generic elements of Blockchain, Features of Blockchain, and Types of Blockchain.

**UNIT – II            BLOCKCHAIN ARCHITECTURE:**

Operation of Bitcoin Blockchain, Blockchain Architecture – Block, Hash, Distributer P2P, Structure of Blockchain- Consensus mechanism: Proof of Work (PoW), Proof of Stake (PoS), Byzantine Fault Tolerance (BFT), Proof of Authority (PoA) and Proof of Elapsed Time (PoET)

**UNIT – III            BLOCKCHAIN-BASED FUTURES SYSTEM:**

Project presentation- Futures smart contract: Blockchain oracles- Web3j: Setting up the Web3J- Installing web3j- Wallet creation, Java client: The wrapper generator- Initializing web3j- Setting up Ethereum accounts- Deploying the contract

**UNIT – IV            BLOCKCHAINS IN BUSINESS AND CREATING ICO:**

Public versus private and permissioned versus permission less blockchains- Privacy and anonymity in Ethereum- Why are privacy and anonymity important? - The Ethereum Enterprise Alliance- Blockchain-as-a-Service- Initial Coin Offering (ICO): Project setup for ICO implementation- Token contracts- Token sale contracts-Contract security and testing the code.

**UNIT – V                    DISTRIBUTED STORAGE IPFS AND SWARM:**

Ethereum Virtual Machine- Swarm and IPFS: Installing IPFS, Hosting our frontend: Serving your frontend using IPFS, Serving your frontend using Swarm, IPFS file uploader project: Project setup the web page

**UNIT – VI                    CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned

## REFERENCES:

1. Imran Bashir, “Mastering Blockchain: Distributed Ledger Technology, decentralization, and smart contracts explained”, 2nd Edition, Packt Publishing Ltd, March 2018.
2. Bellaj Badr, Richard Horrocks, Xun (Brian) Wu, “Blockchain By Example: A developer's guide to creating decentralized applications using Bitcoin, Ethereum, and Hyperledger”, Packt Publishing Limited, 2018.
3. Andreas M. Antonopoulos, “Mastering Bitcoin: Unlocking Digital Cryptocurrencies”, O’Reilly Media Inc, 2015.
4. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, “Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction”, Princeton University Press, 2016.
5. <https://www.simplilearn.com/tutorials/blockchain-tutorial/blockchain-technology>
6. <https://www.ibm.com/in-en/topics/what-is-blockchain>
7. <https://www.investopedia.com/terms/b/blockchain.asp>

## COURSE OUTCOME:

Upon completion of this course, the students will be able to:

- Contentedly discuss and describe the history, types and applications of Blockchain
- Gains familiarity with cryptography and Consensus algorithms.
- Create and deploy projects using Web3j.
- Implement an ICO on Ethereum
- Design blockchain based application with Swarm and IPFS

## MAPPING

### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### **P22CSE3B - Elective Course –III (EC) - BLOCK CHAIN TECHNOLOGY**

PO \ CO	PO1	PO2	PO3	PO4	PO5
<b>22SCC IT5:1</b>	3	3	3	3	3
<b>22SCC IT5:2</b>	2	3	3	3	3
<b>22SCC IT5:3</b>	3	3	3	3	3
<b>22SCC IT5:4</b>	3	3	3	3	3
<b>22SCC IT5:5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3

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**CORE COURSE V**  
**PRINCIPLES OF COMPILER DESIGN/**  
**COMPILER DESIGN (P22ITCC31/ P22CSCC22)**

**UNIT – I INTRODUCTION:**

Basics of Compiler - The Importance of Compilers - A Quick Tour : The Compiler Toolchain – Stages Within a Compiler - Example Compilation - Scanning : Kinds of Tokens - A Hand-Made Scanner - Regular Expressions - Finite Automata - Deterministic Finite Automata - Nondeterministic Finite Automata - Conversion Algorithms - Converting REs to NFAs - Converting NFAs to DFAs - Minimizing DFAs - Limits of Finite Automata - Using a Scanner Generator - Practical Considerations.

**UNIT - II PARSING:**

Overview - Context Free Grammars - Deriving Sentences - Ambiguous Grammars - LL Grammars - Eliminating Left Recursion - Eliminating Common Left Prefixes - First and Follow Sets - Recursive Descent Parsing - Table Driven Parsing - LR Grammars - Shift-Reduce Parsing - The LR(0) Automaton - SLR Parsing - LR(1) Parsing - LALR Parsing - Grammar Classes Revisited - The Chomsky Hierarchy

**UNIT - III THE ABSTRACT SYNTAX TREE:**

Overview - Declarations - Statements - Expressions - Types - Putting it All Together - Building the AST Semantic Analysis : Overview of Type Systems - Designing a Type System - The B-Minor Type System - The Symbol Table - Name Resolution - Implementing Type Checking - Error Messages

**UNIT - IV INTERMEDIATE REPRESENTATIONS:**

Introduction - Abstract Syntax Tree - Directed Acyclic Graph-Control Flow Graph - Static Single Assignment Form - Linear IR - Stack Machine IR - Examples - GIMPLE - GNU Simple Representation - LLVM - Low Level Virtual Machine – JVM Java Virtual Machine - Memory Organization : Introduction - Logical Segmentation - Heap Management - Stack Management - Stack Calling Convention - Register Calling Convention - Locating Data - Program Loading

**UNIT - V CODE GENERATION:**

Introduction - Supporting Functions - Generating Expressions - Generating Statements - Conditional Expressions - Generating Declarations - Optimization: Overview - Optimization in Perspective - High Level Optimizations - Constant Folding - Strength Reduction Loop Unrolling - Code Hoisting - Function Inlining -Dead Code Detection and Elimination - Low-Level Optimizations - Peephole Optimizations - Instruction Selection - Register Allocation - Safety of Register Allocation - Priority of Register Allocation - Conflicts Between Variables - Global Register Allocation - Optimization Pitfalls - Optimization Interactions.

## **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Contemporary Developments Related to the Course during the Semester Concerned.

### **REFERENCES:**

1. Introduction to Compilers and Language Design, Douglas Thain, Lulu Publications, 2020.
2. Compiler Design, Karthi M, Sudha Rani S, Rajkumar Y, Wiley Publication, 2019.
3. A.V. Aho, Ravi Sethi, J.D. Ullman, Compilers- Principles, Techniques and Tools, Addison-Wesley, 2003.
4. Fischer Leblanc, Crafting Compiler, Benjamin Cummings, Menlo Park, 1988. . Kennath C. Loudon, Compiler Construction Principles and Practice, Vikas publishing House, 2004.
5. AllenI. Holub, Compiler Design in C, Prentice Hall of India, 2001.
6. S. Godfrey Winster, S.Aruna Devi, R. Sujatha, “Compiler Design”, yesdee publishers, Third Reprint 2019.
7. <https://riptutorial.com/parsing>
8. <https://www.javatpoint.com/automata-tutorial>
9. [https://www.tutorialspoint.com/compiler\\_design/compiler\\_design\\_intermediate\\_code\\_generations.htm](https://www.tutorialspoint.com/compiler_design/compiler_design_intermediate_code_generations.htm)
10. <https://www.methodsandtools.com/archive/archive.php?id=86>
11. <https://www.i2tutorials.com/compiler-design-tutorial/>

### **COURSE OUTCOME:**

At the end of the course, the students will be able to:

1. Understand the structure of the compilation Process and should be distinguish, what happens at each and every phase of a compiler.
2. Acquire knowledge about parsing techniques.
3. Evaluate the Context-free grammars and parsing methods for removing useless productions symbols and removing epsilon productions.
4. Understand the concepts of Abstract Syntax tree and Intermediate Representations.
5. Apply code optimization techniques to reduce number of instructions in a program.



## MAPPING

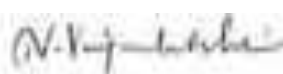
### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### **P22CSCC22 /P22ITCC31 (CC) – Principles of Compiler Design**

<b>PO</b> CO	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22ITCC31/ P22CSCC22:1</b>	3	3	3	3	2
<b>P22ITCC31/ P22CSCC22:2</b>	3	3	3	3	3
<b>P22ITCC31/ P22CSCC22:3</b>	3	3	3	3	2
<b>P22ITCC31/ P22CSCC22:4</b>	2	3	3	3	3
<b>P22ITCC31/ P22CSCC22:5</b>	3	3	3	3	3
<b>AVERAGE</b>	3	3	3	3	3



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## **SEMESTER - IV**

### **CORE COURSE VIII CLOUD COMPUTING (P22ITCC42/P22CS42)**

#### **UNIT – I COMPUTING PARADIGMS:**

High-performance computing, parallel computing, distributed computing, cluster computing, grid computing, cloud computing, bio-computing, mobile computing quantum computing, optical computing. Nano-computing.

#### **UNIT – II CLOUD COMPUTING FUNDAMENTALS:**

Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models.

#### **UNIT – III CLOUD COMPUTING ARCHITECTURE AND MANAGEMENT:**

Cloud architecture, Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure, Managing the Cloud application, Migrating, Application to Cloud, Phases of Cloud Migration Approaches for Cloud Migration

#### **UNIT – IV CLOUD SERVICE MODELS:**

Infrastructure as a Service, Characteristics of IaaS, Suitability of IaaS, Pros and Cons of IaaS, Summary of IaaS Providers, Platform as a Service, Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaS Providers, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros and Cons of SaaS, Summary of SaaS Providers. Other Cloud Service Models

## **UNIT – V CLOUD SERVICE PROVIDERS:**

EMC, EMC IT, Captiva Cloud Toolkit, Google Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue Service, Microsoft Windows Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM Cloud Models, IBM Smart Cloud, SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP, Sales force, Sales Cloud, Service Cloud: Knowledge as a Service, Rack space, VMware, Manjra soft Aneka Platform

## **UNIT – VI CURRENT CONTOURS (for Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester Concerned.

### **REFERENCES:**

1. Essentials of Cloud Computing: K. Chandrasekhran, CRC Press, 2015.
2. Cloud Computing: Principles and Paradigms by RajkumarBuyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
3. Rittinghouse and Ransome, Cloud Computing: Implementation, Management, and Security, CRC Press, 2016.
4. Michael Miller “Cloud Computing Web based application that change the way you work and collaborate online”. Pearson edition, 2002
5. Kris Jamsa, Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More, Jones & Bartlett Learning, 2012.
6. Cloud Computing: Principles and Paradigms by RajkumarBuyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
7. <https://developer.ibm.com/articles/cl-cloudintro/>
8. <https://www.tutorialride.com/cloud-computing/service-models-in-cloud-computing.htm>
9. <https://www.geeksforgeeks.org/architecture-of-cloud-computing/>

### **COURSE OUTCOME:**

At the end of the course, the students will be able to:

1. Compare the strengths and limitations of cloud computing.
2. Identify the architecture, infrastructure and delivery models of cloud computing.
3. Understanding the project management in the cloud environment.
4. Understanding the cloud services.
5. Analyze various cloud service models and apply them to solve problems on the cloud.

## MAPPING

### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium)

3: Substantial (High) If there is no correlation, put

### **P22ITCC42/P22CSCC42 – Core Course VIII–(CC) – Cloud Computing**

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22ITCC42/ P22CSCC42:1</b>	3	3	3	3	3
<b>P22ITCC42/ P22CSCC42:2</b>	2	3	3	3	3
<b>P22ITCC42/ P22CSCC42:3</b>	3	3	3	3	3
<b>P22ITCC42/ P22CSCC42:4</b>	3	3	3	3	3
<b>P22ITCC42/ P22CSCC42:5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	3



**M.Sc Computer Science/M.Sc Information Technology  
P22CSIBC/P22ITIBC**

**ENTREPRENEURSHIP / INDUSTRY BASED COURSE  
Technology Innovation and Sustainable Enterprise**

**UNIT – I        INNOVATION:**

Need - Objectives of innovation - Technology innovation - its importance - Knowledge Management- need - Business strategies related to knowledge management - Knowledge Management Approaches-Transformation of an enterprise through Knowledge Management - Creating Knowledge Management System in Organization Establishing Knowledge Management through IT- Organizational culture for Knowledge Management - Future of Knowledge Management

**UNIT – II        TECHNOLOGY TRANSFER AND JOINT VENTURES:**

Policy, Procedure & Practices-India's Technology base and Capabilities- Preference of Indian Technology-major Constraints and problems- Operational constraints- Problems in Indian Business Environment Problems in Finalization of Agreement- Major Problems in Technology transfer Collaboration Agreements, R&D, Import Substitution, Scaling, Diagrams- Patterns and Intellectual Property rights.

**UNIT – III        WEB MARKETING:**

Meaning- Benefits of Web Marketing-Myths and Facts in Web Marketing Web Psychology: Understanding the Internet mind- The Internet and the Law: Copyright, Censorship, Privacy, Jurisdiction- Do's and Don'ts on Web

**UNIT – IV        WEB MARKETING STRATEGIES:**

Choosing the strategy- Online store fronts -Target Marketing Attracting Customers- Web Advertising - E-Mail Marketing-Instant market research - Securities Issues

**UNIT – V        ENTERPRISE RESOURCE PLANNING:**

The E- Business backbone -Meaning- ERP decision Enterprise Architecture Planning- ERP Implementation- The Future of ERP Applications- Procurement- Business Blueprint Planning.

## UNIT – VI CURRENT CONTOURS (for Continuous Internal Assessment Only):

Contemporary Developments Related to the Course during the Semester Concerned.

### REFERENCES:

1. Knowledge Management for Competitive advantage-Harish chandra Chaudharaty, Excel Books Publications, New Delhi
2. Technology Transfer and Joint Ventures Abroad-R.R.Azad, Deep& deep Publications, New Delhi
3. Web Advertising and marketing thomas J Kuegler,Jr. #rd Edition-Prentice-Hall of India, New Delhi
4. e-Business Roadmap for Success- Dr.ravi Kalakota- Perason Education
5. "Frontiers of Electronic Commerce", Ravi Kalakota, Andrew B. Whinston, Addition -Wesley, 2000
6. The Lean Startup by Eric Ries,Publisher : Eric Ries, 2017  
Start Up India :
7. <http://www.startupindia.gov.in/pdffile.php?title=Startup%20India%20Action%20Planandtype=Actionandq=Action%20Plan.pdf&contenttype=Actionandsubmenupoint=action>  
About – Entrepreneurship Development Institute of India (EDII) :
8. <http://www.ediindia.org/institute.html> EDII  
– Centres :
9. <http://www.ediindia.org/centres.html>  
The National Institute for Entrepreneurship and Small Business DevelopmentPublications:
10. <http://niesbud.nic.in/Publication.html>

### COURSE OUTCOME:

At the end of the course, the students will be able to:

- Identify entrepreneurial traits.
- Develop comprehensive business plans.
- Prepare plans to manage the enterprise effectively.
- Acquire knowledge about Web Marketing
- Understand ERP techniques

## MAPPING

### CO - PO matrices of course


1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### **P22ITIBC/P22CSIBC – ENTREPRENEURSHIP / INDUSTRY BASED COURSE**

#### **Technology Innovation and Sustainable Enterprise**

CO \ PO	PO1	PO2	PO3	PO4	PO5
P22ITIBC P22CSIBC:1	3	3	3	3	2
P22ITIBC P22CSIBC:2	3	3	3	3	3
P22ITIBC P22CSIBC:3	3	3	3	3	2
P22ITIBC P22CSIBC:4	2	3	3	3	3
P22ITIBC P22CSIBC:5	3	3	3	3	3
<b>AVERAGE</b>	3	3	3	3	3

  
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## **M.Sc Computer Science**

### **P22CSCC41 - Core Course – VII (CC) – AGILE TECHNOLOGIES**

#### **SYLLABUS: P22CSCC41 - Core Course – VII (CC) - AGILE TECHNOLOGIES**

**UNIT – I INTRODUCTION:** Theories for Agile Management – Agile Software Development – Traditional Model vs. Agile Model - Classification of Agile Methods – Agile Manifesto and Principles – Agile Project Management – Agile Team Interactions – Ethics in Agile Teams - Agility in Design, Testing – Agile Documentations – Agile Drivers, Capabilities and Values

**UNIT – II AGILE PROCESS:** Lean Production - SCRUM, Crystal, Feature Driven Development- Adaptive Software Development - Extreme Programming: Method Overview – Lifecycle – Work Products, Roles and Practices.

**UNIT – III AGILITY AND KNOWLEDGE MANAGEMENT:** Agile Information Systems – Agile Decision Making - Earl\_S Schools of KM – Institutional Knowledge Evolution Cycle – Development, Acquisition, Refinement, Distribution, Deployment , Leveraging – KM in Software Engineering – Managing Software Knowledge – Challenges of Migrating to Agile Methodologies – Agile Knowledge Sharing – Role of Story-Cards – Story-Card Maturity Model (SMM).

**UNIT – IV AGILITY AND REQUIREMENTS ENGINEERING:** Impact of Agile Processes in RE–Current Agile Practices – Variance – Overview of RE Using Agile – Managing Unstable Requirements – Requirements Elicitation – Agile Requirements Abstraction Model – Requirements Management in Agile Environment, Agile Requirements Prioritization – Agile Requirements Modeling and Generation – Concurrency in Agile Requirements Generation.

**UNIT – V AGILITY AND QUALITY ASSURANCE:** Agile Product Development – Agile Metrics – Feature Driven Development (FDD) – Financial and Production Metrics in FDD – Agile Approach to Quality Assurance - Test Driven Development – Agile Approach in Global

## Software Development

**UNIT – VI CURRENT CONTOURS:** (For continuous internal assessment only):  
Contemporary Developments Related to the Course during the Semester Concerned

### **REFERENCES:**

1. David J. Anderson and Eli Schragenheim, —Agile Management for Software Engineering: Applying the Theory of Constraints for Business Results||, Prentice Hall, 2003.
2. Hazza and Dubinsky, —Agile Software Engineering, Series: Undergraduate Topics in Computer Science||, Springer, 2009.
3. Craig Larman, —Agile and Iterative Development: A Manager\_s Guide||, Addison-Wesley, 2004.
4. Kevin C. Desouza, —Agile Information Systems: Conceptualization, Construction, and Management||, Butterworth-Heinemann, 2007.

### **COURSE OUTCOME**

- CO1.** Realize the importance of interacting with business stakeholders in determining the requirements for a software system
- CO2.** Perform iterative software development processes: how to plan them, how to execute them.
- CO3.** Develop techniques and tools for improving team collaboration and software quality.
- CO4.** Understand requirement engineering.
- CO5.** Understand quality assurance

## MAPPING


### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### **P22CSCC41 - Core Course – VII (CC) - AGILE TECHNOLOGIES**

CO \ PO	PO1	PO2	PO3	PO4	PO5
<b>P22CSCC41.1</b>	3	3	3	3	3
<b>P22CSCC41.2</b>	3	3	2	2	3
<b>P22CSCC41.3</b>	3	3	3	3	2
<b>P22CSCC41.4</b>	3	3	2	2	2
<b>P22CSCC41.5</b>	3	3	3	3	3
<b>Average</b>	3	3	3	3	2

  
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**M.Sc Information Technology**  
**P22CSCC11 - CORE COURSE VII–SOFTWARE PROJECT MANAGEMENT**

**UNIT – I PROJECT EVALUATION AND PROJECT PLANNING:**

Importance of Software Project Management – Activities – Methodologies –Categorization of Software Projects – Setting objectives – Management Principles –Management Control – Project portfolio Management – Cost-benefit evaluation technology – Risk evaluation – Strategic program Management – Stepwise Project Planning.

**UNIT – II PROJECT LIFE CYCLE AND EFFORT ESTIMATION:**

Software process and Process Models – Choice of Process models – Rapid Application development – Agile methods –Dynamic System Development Method– Extreme Programming– Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points – COCOMO II – a Parametric Productivity Model.

**UNIT – III ACTIVITY PLANNING AND RISK MANAGEMENT:**

Objectives of Activity planning – Project schedules – Activities –Sequencing and scheduling – Network Planning models – Formulating Network Model – Forward Pass & Backward Pass techniques – Critical path (CRM) method – Risk identification – Assessment – Risk Planning –Risk Management – – PERT technique – Monte Carlo simulation – Resource Allocation – Creation of critical paths – Cost schedules.

**UNIT – IV PROJECT MANAGEMENT AND CONTROL:**

Framework for Management and control – Collection of data – Visualizing progress – Cost monitoring Earned Value Analysis – Prioritizing Monitoring –Project tracking – Change control – Software Configuration Management –Managing contracts – Contract Management.

**UNIT – V STAFFING IN SOFTWARE PROJECTS:**

Managing people – Organizational behavior – Best methods of staff selection –Motivation –The Oldham Hackman job characteristic model – Stress – Health and Safety – Ethical and Professional concerns – Working in teams – Decision making – Organizational structures – Dispersed and Virtual teams – Communications genres – Communication plans – Leadership.

**REFERENCES:**

1. Bob Hughes, Mike Cotterell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.
2. Robert K. Wysocki —Effective Software Project Management – Wiley Publication, 2011.
3. Walker Royce: —Software Project Management- Addison-Wesley, 1998.
4. Gopalaswamy Ramesh, —Managing Global Software Projects – McGraw Hill Education (India), Fourteenth Reprint 2013.
5. [https://www.tutorialspoint.com/management\\_concepts/project\\_management\\_processes.html](https://www.tutorialspoint.com/management_concepts/project_management_processes.html)

6. [https://www.tutorialspoint.com/estimation\\_techniques/estimation\\_technique\\_s\\_overview.htm](https://www.tutorialspoint.com/estimation_techniques/estimation_technique_s_overview.htm)
7. <https://www.javatpoint.com/software-engineering-personnel-planning>

## **COURSE OUTCOME**

- CO1.** Understand Project Management principles while developing software.
- CO2.** Gain extensive knowledge about the basic project management concepts, framework and the process models.
- CO3.** Obtain adequate knowledge about software process models and software effort estimation techniques.
- CO4.** Estimate the risks involved in various project activities.
- CO5.** Define the checkpoints, project reporting structure, project progress and tracking mechanisms using project management principles.

## MAPPING

### CO - PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

#### **P22ITCC41 - Course Outcome-VII - SOFTWARE PROJECT MANAGEMENT**

<b>CO \ PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22ITCC41.1</b>	3	3	3	3	3
<b>P22ITCC41.2</b>	3	3	2	2	2
<b>P22ITCC41.3</b>	3	3	2	3	2
<b>P22ITCC41.4</b>	3	3	2	2	2
<b>P22ITCC41.5</b>	3	3	3	3	2
<b>Average</b>	3	3	3	3	2



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## **DEPARTMENT OF FASHION TECHNOLOGY**

### **Programme outcomes**

**PSO 1:** Recognize appropriate apparel designing and fashion process

**PSO 2:** Impart relevant knowledge and skills in apparel and fashion designing.

**PSO 3:** Design and develop novel products and manufacturing processes in fashion apparels as per the need of the hour

**PSO 4:** Regulate the standards and follow them for apparel and fashion designing.

**PSO 5:** Become successful entrepreneur in Textile and related field and contributing to societal, technological and industry development

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## **CORE COURSE II**

### **22SCCFT2- FASHION CLOTHING & PSYCHOLOGY**

#### **Objectives;**

- Understand the psychological needs of fashion
- impart knowledge about fashion accessories and designing for figure irregularities.
- Explain the current scenario of the world fashion centers.

#### **UNIT - I FACTORS AFFECTING FASHION CHANGES:**

Psychological needs of fashion, Socio Psychology of fashion, Technology, Economical, Political, legal and seasonal. Recurring silhouettes – changes in silhouettes from 1895 onwards; fashion cycle; fashion Prediction; \*Role of costumes as status symbol, clothes as sex appeal, self-identity, cultural value.

#### **UNIT - II FIGURE IRREGULARITIES:**

Stout figure, thin figure, slender figure, narrow shoulders, broad shoulders, round shoulders, large bust, flat chest, large hip, large abdomen, round face, large face, small face and broad face, prominent chin and jaw and prominent forehead. Wardrobe planning and factors to be considered while selecting clothes for different age groups (men and women).

#### **UNIT - III FASHION FORECASTING:**

Color, fabrics, Current fashion silhouettes, texture, designs - Designer types – classicist, idealist, Influenced, Realist, Thinking poet.

#### **UNIT - IV WORLD FASHION CENTRES:**

France, Italy, America, India, and Far East.

#### **UNIT - V FASHION ACCESSORIES:**

Shoes, handbags, jewellery, hats, ties and others. Prepare a picture album for accessories.

## COURSE OUTCOME

CO1: Understand the psychological aspects behind fashion and style

CO2: Analyse human anatomy and different types of body contour.

CO3: Describe different facial figures features and postures.

CO4: Illustrate male and female wear on Croque and develop designer wears

CO5: Acquaintance with different types of accessories suitable for fashion garments

### Course Mapping

#### 22SCCFT2- FASHION CLOTHING & PSYCHOLOGY

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO \ PO	PO1	PO2	PO3	PO4	PO5
CO.1	2	3	2	-	-
CO.2	2	2	3	2	1
CO.3	-	-	2	2	-
CO.4	3	2	3	2	3
CO.5	3	2	3	2	3
Average	2	2	3	2	1

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2024-25  
Jagad Gurukul Fashion Technology &  
Designing  
Maharaja Ganga Pratap  
Vishwanath - 2024-25

## **FIRST ALLIED COURSE III**

### **22SACFT2- Pattern Making techniques**

#### **Objectives:**

- Acquire skills about types of patterns making.
- Learn pattern alteration skills and garment fitting.
- Understand the techniques of the pattern grading and alteration

#### **UNIT - I FABRIC PREPARATION & LAYOUT PLANNING:**

Fabric preparation: \*Preparing the fabric for cutting, Importance of grain in fabric cutting and garment construction. Methods of straightening fabric grains. Lay planning Introduction, Rule to remember in pattern layout. Types of layout. Transferring pattern markings stay stitching, ease stitching.

#### **UNIT - II PATTERN DRAFTING:**

Preparation of paper patterns. Advantages of paper pattern. Pattern drafting with personal measurement. Principles for pattern drafting. Preparing draft for basic bodice, sleeve and skirt pattern

#### **UNIT - III FLAT PATTERN TECHNIQUES:**

Definition, Pivot method, Slash & spread method, measurement method. Creating styles through dart manipulation and relocation of dart.

#### **UNIT - IV COMMERCIAL PATTERN AND PATTERN GRADING:**

Commercial pattern: \*Definition, merits and demerits, Development of commercial pattern. Pattern Grading: Definition, Grading terminology, selecting a grading system, grading techniques, their advantages and disadvantages. Computer grading. Grading procedures. Grading of basic block using draft grading systems.

#### **UNIT - V: PATTERN ALTERATION, GARMENT FITTING AND ASSEMBLING:**

Pattern alteration: Methods of identifying pattern alteration. General principles for pattern alteration. Common pattern alteration in a fitted bodice pattern. Garment fitting and Assembling: Standards for a good fit, checking for good fit, solving fitting problems and remedies.

## COURSE OUTCOME

CO1: Define the pattern making techniques and classify type of layouts.

CO2: Explain the drafting procedures and techniques

CO3: Choose the flat pattern techniques best suited for fashion designing

CO4: Understand the concepts of pattern grading techniques

CO5: Identify the methods of pattern alteration

## Course Mapping

### 22SACFT2- Pattern Making techniques

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO \ PO	PO1	PO2	PO3	PO4	PO5
CO.1	3	3	3	2	1
CO.2	2	3	3	2	2
CO.3	3	3	2	2	2
CO.4	2	2	3	2	2
CO.5	2	2	3	2	2
Average	2	2	3	2	2

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## CORE COURSE IV

### 22SCCFT4- GARMENT MANUFACTURING TECHNOLOGY

#### Objectives:

- Gain knowledge on the industrial practices in all the stages of garment manufacturing
- To gain knowledge about spreading, marking and cutting techniques.
- To study about the sewing machineries, stitching mechanisms.

#### **UNIT - I Marker making and cutting:**

Planning, drawing and reproduction of the marker- Requirements of marker planning and efficiency of the marker plan. Spreading of fabric - forming a lay, requirement of the spreading process, methods of spreading and nature of fabric packages. Fabric cutting- objectives and methods of cutting.

#### **UNIT - II Seam and sewing problem:**

The properties of seam, seam types, stitch types. Sewing machine feed mechanism, sewing machine needles, Sewing threads, fiber type, and construction of thread finishes. \*Thread sizing, thread packages, cost, properties and seam performance. Sewing problems, Problems of stitch formation. Problem of pucker, problems of Damage to fabric along the stitch line. Testing for sewability and Tailorability.

#### **UNIT - III Basic sewing machines and associated work aids, simple automation:**

The use of components & trims – Labels and motifs, lining, Interlining, wadding, lace, braids & elastics, Hooks and loop fastening, Seam binding and tape, Shoulder pad, Eyelets & laces, Zip fastener, Buttons, Tack buttons, Snap fasteners and Rivets, Performance properties of components and trims

#### **UNIT - IV Fusing:**

Definition, advantages of fusible interlinings, Fusing process. The means of fusing, Fusing equipments, Methods of fusing, quality control in fusing. Alternative of fusible interlining.

#### **UNIT - V Pressing:**

Purpose of pressing, categories of pressing, means of pressing, pressing equipments and methods, pleating, permanent press. Pressing practices in Indian Industries

## COURSE OUTCOME

CO1: Remember the working flow of cutting department.

CO2: Understand the cutting and sewing machineries used

CO3: Evaluate the sewing accessories used in garment industries

CO4: Remember the various finishing machineries used

CO5: Elaborate about pressing.

## Course Mapping

### 22SCCFT4- GARMENT MANUFACTURING TECHNOLOGY

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO \ PO	PO1	PO2	PO3	PO4	PO5
CO.1	3	3	2	2	1
CO.2	2	3	2	2	2
CO.3	1	3	1	2	1
CO.4	2	2	3	2	2
CO.5	2	2	3	2	2
Average	2	2	2	2	2

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## SECOND ALLIED COURSE III

### 22SACFT4- DRAPING

#### Objectives:

- Introduce draping techniques for development of bodice blocks and variations
- Understand the relevance of draping in fashion.
- Identify draping techniques for specific garment features and pattern shapes

#### **UNIT - I INTRODUCTION TO DRAPING:**

Definition of Draping – Draping Tools & Equipment's – Draping principles – Preparation of muslin for Draping – Seam allowance – Preparation of Dress form for Draping. Apex, Balance, plumb line, Trueing, Blocking, Blending, Princess Line, clipping & Marking-Principles of Draping.

#### **UNIT - II BASICS OF DRAPING:**

Draping of Basic Bodice front – Preparation of muslin – Draping steps – Marking – Truing - Draping of Basic Bodice Back – Draping of Basic Sleeve – Draping of Basic Skirt.

#### **UNIT - III DRAPING OF SKIRTS:**

Draping of one piece basic skirt – Gored skirt – Flared skirt – Pleats in the flared skirt – Gathers in the flared skirt – Pleated skirt – Side & Box pleated skirt – Kick pleated and inverted pleated skirt

#### **UNIT - IV DRAPING OF YOKES, SLEEVES & COLLARS:**

Draping of fitted midriff Yoke -- Shirt yoke – Hip Yoke. Draping of – Mandarin Collar – Convertible collar – Peter Pan collar. Draping of Basic Dolman sleeve – Long fitted Dolman sleeve -- Reglan sleeve.

#### **UNIT - V DRAPING OF ADVANCED DESIGN IN GARMENTS**

Draping for Men's trouser (pleats and Flange) -Draping for Women's Tops (application of Dart manipulation principle)- Draping for children's dresses - Creative Draping

## COURSE OUTCOME

CO1: Remember the tools and techniques used for draping.

CO2: Understand the terminologies used in draping

CO3: Apply the draping techniques in basic garment construction

CO4: Create variations in different garments

CO5: Assessment of draping techniques for dress designing.

## Course Mapping

### 22SACFT4- DRAPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO CO	PO1	PO2	PO3	PO4	PO5
CO.1	3	2	3	2	2
CO.2	1	2	2	1	-
CO.3	3	3	3	3	3
CO.4	3	2	3	2	2
CO.5	3	3	2	2	2
Average	3	2	3	2	2

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**CORE COURSE VII**  
**22SCCFT7-FABRIC STRUCTURE AND**  
**DESIGN**  
**(Theory)**

**COURSE OBJECTIVES:**

- Learn the elements of woven design
- Study the different types of weaves
- Understand the draft and lifting plan

**UNIT - I:**

Elements of woven design-methods of fabric representation-weave repeat unit- draft and lifting plan- construction for elementary weaves-plain warp rib-weft rib- twill-modification of twills-satin & sateen weaves-their derivatives.

**UNIT - II:**

Ordinary and brighten comb-its modification- huck a back-its modification-crepe weave -mock leno.

**UNIT - III:**

Extra warp & extra weft figuring-single & live colours—backed fabrics-warp and weft backed fabrics. Bedford cords.

**UNIT - IV:**

Pile fabrics-basic structure-twill back & satin back-weft pile length density-and fastness of pile-teny pile-3pile-4pile-and 6 pile.

**UNIT - V:**

Double cloth-classification-self stitched-face to back-back to face-stitched double cloth warp and weft center stitched double cloth-Triple cloth.

## COURSE OUTCOME

CO1: Classify different types of weaves

CO2: Draw the design, draft & peg plan of weaves

CO3: Differentiate between different types of weaves

CO4: Understand the properties of woven fabric

CO5: Construct different types of weaves.

## Course Mapping

### 22SCCFT7- EXPORT DOCUMENTATION

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO.1	2	2	1	2	2
CO.2	3	2	2	1	3
CO.3	3	2	3	-	2
CO.4	3	2	2	-	1
CO.5	2	3	2	2	2
Average	2	2	2	1	2

  
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## **CORE COURSE VIII**

### **22SCCFT8- QUALITY AND COST CONTROL**

#### **Objectives:**

1. To know about raw material quality control Specifications.
2. To understand the importance of quality control in textiles and apparel industries.

#### **Unit I Basics of Quality Control**

Definition and Scope of Quality Control – Establishing Merchandising Standards – Establishing Raw Material Quality Control specifications – Quality Control of Raw Material.

#### **Unit II Quality Control System**

Establishing Processing quality specification – Training Quality Control Personnel – The Quality Standard Control – Quality Control Inspection, Procedures for processing – Quality control of finished garments – Quality control and Government contacts – Quality Control for Packaging, Warehousing and shipping – Statistical Quality Control, Sampling plans – industry – wide quality standards.

#### **Unit III Basics of Production control**

Function of Production control – Production, Analysis – Quality Specifications – Quantitative specifications – Scope of Apparel Manufacturing Activity – Co-coordinating departmental Activities – Distribution of Documents and Records.

#### **Unit IV Production Control System**

Type of Control forms – Basic Production Systems – Principles for Choosing a Production System – Evaluating Production Systems – Flow Process Grids and Charts – Basic Flow Process Grid Construction – Flow Process Grids for Production control – Scheduling Calculation; Graph Methods. Scheduling, bundles of varying amounts. Mathematical formulas for scheduling – Producing many styles simultaneously, producing many styles consecutively in one line.

#### **Unit V Cost Control**

Function of Cost Control: Types of Costs and Expenses – Apparel Manufacturing Cost Categories – Sales Cost Control – Purchasing Cost Control – Production Cost Control – Administration cost control – Cost Ration Policies – the manufacturing Budget – Cash flow Control – Standard Cost Sheet, Break–Even Charts.

## COURSE OUTCOME

**CO1:** Understand the basic concepts of quality control

**CO2:** Compare the quality control system

**CO3:** Describe the basic production system

**CO4:** Clarify about concept of production control

**CO5:** Illustrate the cost control

## Course Mapping

### 22SCCFT8- QUALITY AND COST CONTROL

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO \ PO	PO1	PO2	PO3	PO4	PO5
CO.1	2	3	2	3	1
CO.2	2	2	-	2	-
CO.3	3	2	3	2	1
CO.4	2	3	2	3	2
CO.5	1	2	-	3	2
Average	2	2	1	2	1

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**MAJOR BASED ELECTIVE II**  
**22SMBEFT2A FABRIC CARE**  
**(Theory)**

**OBJECTIVES**

- Study of different industry materials for cleaning, pressing and finishing textiles.
- To learn the appropriate equipment and procedures for the care of textile products.
- To understand the symbols used in textile care labeling system at an international level.

**UNIT - I Laundry Soaps:**

Water – Hard and Soft water, methods of softening water. Laundry soaps- types of soap, Manufacture of soap, composition of soap, properties of soap. Soap less detergents - Detergent, Manufacture, merits and demerits of detergent

**UNIT - II Laundry Equipment:**

Laundry equipment – for storage, steeping and washing. Types of equipment's – wash board, suction washer, wash boiler, washing machine. Drying equipment's – outdoor and indoor types. Irons and ironing board – Types.

**UNIT - III Stiffening:**

Stiffening agents - starch and other stiffening agents, preparation of starch. Bleaching agents - \*Types of Bleaching agents. Grease Removers - Grease solvents-Grease Absorbents. Laundry blues and their application - Optical blues.

**UNIT - IV Washing:**

Principles of washing, kneading and squeezing. Methods of finishing - Laundering & their principles -Damping, ironing, pressing, steaming, mangling, calendaring - care & cleaning of irons. Laundering of different fabrics – Cotton, Linen, Woolens, Colored fabrics, Silks and Rayon.

**UNIT - V Dry Cleaning:**

Dry cleaning-Definition and its types. Stain Removal - Classification into Animals, vegetables, Grease, Dye & Mineral stains - scorch and Grass stains - General rules and ways of stain removal.

## COURSE OUTCOME

**CO1:** Understand the different types of laundry reagent and Soaps

**CO2:** Classify laundering equipment & its types.

**CO3:** Describe about stiffening agents.

**CO4:** Recognize the principles of washing & Finishing.

**CO5:** Develop the ability to fabric stain and its removing process.


## Course Mapping

### 22SMBEFT2A- FABRIC CARE

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO CO	PO1	PO2	PO3	PO4	PO5
CO.1	1	2	-	2	-
CO.2	1	2	-	1	2
CO.3	2	2	-	3	-
CO.4	1	2	-	2	2
CO.5	1	2	-	2	2
Average	1	2	-	2	1

  
2024-25  
2024-25 Fashion Technology &  
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**MAJOR BASED ELECTIVE II**  
**22SMBEFT2B- APPAREL COSTING**  
**(Theory)**

**OBJECTIVES:**

- Impart learning about principles of costing and budgeting
- Impart learning about costing procedure for various garment styles
- Impart learning about costing procedure for export and domestic products

**UNIT - I      Elements of Cost:**

Principles of costing - requirements of good costing system - cost unit - types of costs - Elements of cost - direct material cost - direct expenses - direct wages - indirect materials - indirect expenses - indirect labour - overheads - allocation of overheads - accounting of prime cost and overhead cost - cost sheet preparation - cost of production - total cost. INCO terms & its relationship with costing.

**Unit - II    Budgeting:**

The budgeting process: Budgeting principles for the apparel industry- types of budgets- Fixed vs. variable budget - Master budget- laminations of budgets- any justification effort - Planned Vs Actual Cost. Budgeting and control in apparel industry.

**UNIT - III      Fabric Cost Estimation:**

Cost estimation of yarn-knitted fabric-dyeing, printing and finishing. Woven fabric costing: fabric types-yarn consumption-weaving price. Cost estimation for cutting-stitching-checking-packing- forwarding, shipping, and insurance. costing of apparel - woven-knits of various styles-accounting of prime costs and overhead costs-allocation of overheads-cost control-cost sheet preparation

**UNIT - IV      Factory Cost Estimation:**

Estimation of factory cost for Woven and Knitted - vest-briefs-shorts-t-shirts- pyjamas- children's wear-ladies wear-woven shirt-woven tops & bottom. Various factors to be considered in costing for domestic products and international products.

**UNIT - V      Pricing:**

Determining Pricing of apparel products: Price elasticity of demand and supply- sample costing marginal revenue and marginal cost-cost plus pricing methods; Full cost pricing-conversion cost pricing-differential cost pricing-variable cost pricing-direct cost pricing-derivation of cost of apparel products-woven/knits.

## COURSE OUTCOME

**CO1:** Understand the elements of cost in pricing apparels

**CO2:** Learn about the Budgeting process

**CO3:** Learn about the cost estimation techniques for various fabrics

**CO4:** Evaluate the factory cost of the garment

**CO5:** Learn about the pricing of garments.

## Course Mapping

### 22SMBEFB- FASHION MERCHANDISING & MARKETING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO.1	2	3	3	3	1
CO.2	3	2	2	3	2
CO.3	3	2	2	3	2
CO.4	3	2	2	3	3
CO.5	3	2	2	3	2
Average	3	2	2	3	2

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Product Designing  
Sri Lanka Institute of Fashion Design  
T. 011-25252525 - 2025



**SKILL BASED ELECTIVE II**  
**22SSBEFT2-ENTREPRENEURSHIP**  
**DEVELOPMENT**  
**(Theory)**

**OBJECTIVES:**

- To develop entrepreneurship skills among the students in Fashion industry.
- To familiarize the students with the process and procedure of setting up, new enterprises.
- To know about intellectual property rights.

**UNIT – I Scope of Entrepreneurship:**

Introduction to entrepreneurship, development of entrepreneurship, role of entrepreneurs in development of apparel and fashion industry, entrepreneurship with reference to fashion and apparel industry in India.

**UNIT – II Organizations:**

Entrepreneurial support by state, central financial institutions, organizations. Government policies with reference to textile and apparel industry.

**UNIT – III Entrepreneurship in Apparel Industry:**

Business planning – Starting a new venture related to apparel industry, essentials of a successful centre; Location & plant layout-factors, influencing plant location, building, structure, lighting, ventilation, material handling, availability of labour, material management and transportation.

**UNIT – IV Management of New Enterprises:**

Financing of enterprise-various forms ownership of business- knowledge on various forms of taxation by government .Income tax Excise duty, TIN, GST Sales Tax, Customs duty, Surcharge, registration and licensing fees-growth strategies- Corporate social responsibility causes and prevention of sickness in industry

**UNIT – V Intellectual Property Rights:**

Intellectual property rights laws in India -patent-trade marks-industrial design- copy rights-need and benefits of registration IP-WIPO and its activities-TRIPS Agreement-Government support to MSME for registration of IP

## COURSE OUTCOME

**CO1:** Recognize the factors affecting Entrepreneurship growth and their problems

**CO2:** Outline the importance of Entrepreneurial Development programmes

**CO3:** Describe the Business identification, selection and formulation procedure.

**CO4:** Indicate the role of government in entrepreneurial development.

**CO5:** Underline the basis of intellectual property rights in India

## Course Mapping

### 22SSBEFT2 - FASHION BUSINESS

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO.1	2	1	-	2	2
CO.2	2	1	-	2	3
CO.3	2	1	-	2	3
CO.4	2	1	-	2	3
CO.5	2	1	-	2	3
Average	2	1	-	2	3

*B. J. K.*  
2022-2023  
Dept of Fashion Technology &  
Electronics Designing  
Shri Mataji Institute Gandhinagar Campus  
Tiruchirappalli - 620 002



## **DEPARTMENT OF FASHION TECHNOLOGY**

### **Programme outcomes**

**PSO 1:** Recognize appropriate apparel designing and fashion process

**PSO 2:** Impart relevant knowledge and skills in apparel and fashion designing.

**PSO 3:** Design and develop novel products and manufacturing processes in fashion apparels as per the need of the hour

**PSO 4:** Regulate the standards and follow them for apparel and fashion designing.

**PSO 5:** Become successful entrepreneur in Textile and related field and contributing to societal, technological and industry development

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## **CORE COURSE**

### **22SCCFT1-INTRODUCTION TO FASHION DESIGNING**

#### **Objectives:**

1. To understand the fashion concepts and scope of fashion industry.
2. To know the basic principles of designing.

#### **Unit I Fashion Concept**

Meaning of Fashion, Origin of Fashion, Meaning of Fashion Designing, Classification of Fashion, Influence of Fashion; Fashion illustration and Fashion cycle.

#### **Unit II Fashion Industry and Fashion Promotion**

Fashion Industry - Boutique and its importance, present structure of Fashion industry; Textiles and materials in Fashion industry; the structure of the Fashion market. Fashion Promotion – Impact of Fashion promotion; Fashion Advertising and its objectives, fashion journalism and its objectives;

#### **Unit III Elements of art and Principles of Design**

Design – Structural design, decorative design, basic silhouette. Elements of art and principles of design. Application of principle of design in dress.

#### **Unit IV Colour**

Introduction to colour, colour wheel (Prang & Munsell system) Properties and qualities of colour, colour scheme Theories of colour harmony, colour and garment, colour selection. Principles of combining colour. Procedure for combining colour.

#### **Unit V Career in fashion**

Scope of Fashion business, choosing a career in Fashion, Career in Manufacturing, Designing, Career in Retailing, Residential Buying office careers, Career in Fashion service organizations, Freelancing.

## Course Outcome

CO1: Understand the basic concepts of design.

CO2: Identify the terms related to fashion designing

CO3: Acquire knowledge on elements and principles of design

CO4: Gain expertise on the application of color theories

CO5: Identify the scope of fashion business.

## Course Mapping

### 22SCCFT1-INTRODUCTION TO FASHION DESIGNING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

CO \ PO	PO1	PO2	PO3	PO4	PO5
CO.1	3	2	3	1	-
CO.2	3	3	2	1	-
CO.3	3	3	2	1	-
CO.4	3	2	2	3	-
CO.5	3	3	3	2	2
Average	3	3	2	2	1

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Technology - 2019-2020

**FIRST ALLIED COURSE 1**  
**22SACFT1- TEXTILE SCIENCE**

**Objectives:**

1. To enable students to gain knowledge in yarn making.
2. To teach different types of fabric construction.

**Unit I Fiber and Yarn manufacturing**

**Fiber** – Definition, Classification of Fiber.

**Yarn** – Definition, Conventional ring spinning method- Passage of material through carding, doubling, combing, drawing, roving, and spinning. Yarn twist, yarn count. Types and characteristics of yarns – ply yarns, cable yarns, double yarns and novelty yarns and its types.

**Unit II Yarn manufacturing**

Modern spinning methods – Passage of material through open end spinning, Friction spinning, Electrostatic spinning, Airjet spinning, Twistless spinning. Filament yarn spinning methods wet spinning, dry spinning, melt spinning, (Bicomponent spinning, film splitting). Sewing thread – construction of threads, thread sizes, thread selection

**Unit III Weaving**

Preparation for weaving (warping, sizing, looming) Basic loom structure. Weaving-Definition, Primary motion – shedding – Definition and a brief explanation, picking (shuttle and shuttle less looms), beating up. Secondary motion – Definition and Ancillary motion. Types of selvages. Construction of cloth designs - Design, draft and pegplan. Classification of weaves – plain weave, twill, Satin, Crepe, Pile, double cloth, (Climax) dobby and Jacquard, (double lift double cylinder) Identification of woven fabric defects.

**Unit IV Knitting**

Knitting – Definition, Comparison between woven fabrics and knitted fabric.

Classification of knitted fabrics weft knitting – plain knit stitch, Rib stitch, Warp knitting - Tricot knit, Raschel Knit, Milanese Knit, (Jacquard knit, pile knit, Terry knit, velour knit) Identification of knitted fabric defects.

**Unit V Felted and Non woven fabrics**

Felted fabrics – Felting process. Types of felt, properties and uses of felt. Non woven – Definition, classification of non-woven fabrics, web forming techniques, bonding techniques, and finishing techniques. Characteristics of non-woven, uses of non-woven fabrics.

## Course Outcome

CO1: Understand the basics of fiber and yarn

CO2: Acquire knowledge about fabric making techniques

CO3: Understanding the concepts of weaving, knitting and non-woven fabrics

CO4: Classify the different types woven, knitted and non-woven fabrics

CO5: Develop expertise on understanding the properties of and uses woven, knitted and non -woven fabrics.

## Course Mapping

### 22SACFT1- TEXTILE SCIENCE

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO.1	2	1	3	3	-
CO.2	3	3	3	3	1
CO.3	3	3	3	3	1
CO.4	3	2	3	2	2
CO.5	3	2	3	2	2
Average	3	2	3	3	1

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**CORE COURSE -III**  
**22SCCFT3 - WET PROCESSING**

**Objectives:**

1. To educate students about textile dyeing and printing
2. To make them understand various textile finishes.

**Unit I Textile Processing**

Definition, Need for Processing, Dry and Wet Processing as related to common fabrics: Cotton, Silk, Wool and synthetics.

**Unit II Preparatory process**

Meaning, Need for preparatory processes. Types - Singeing, Scouring, bleaching, mercerizing, desizing.

**Unit III Dyeing**

Classification of dyes and Stages of dyeing, Characteristics of dyes, Direct, Vat, Sulphur, reactive, naphthol, acid, Basic and Disperse Dyes - Method of dyeing Cotton, Silk, Wool and Synthetics with respective dyes, Dyeing of fibre blends.

**Unit IV Printing and Printing procedure**

Definition types, Direct style-block, stencil, screen, roller printing, Duplex printing, Rotary, Transfer printing, Discharge style, Resist style,- Batik, tie and dye, Minor printing methods- Flocking, Marbling, Photoprinting, Warp printing and Air brush printing.

**Unit V Textile Finishes**

Calendaring, Stentering, Stiffening, Decanting, Beetling, Glazing, Schreinerizing, Embossing, Moiering, Ciering, Raising, Napping, Giggling, Shearing. Water Proofing, Water repellency, Sanforizing, Wash and Wear, fire proofing, Crepe and Crinkle effect.



## Course Outcome

CO1: To understand about basics of processing

CO2: Acquire knowledge about preparatory process of fabric

CO3: Understands about the concepts of dyeing techniques & dyeing methods

CO4: To study about printing techniques & its types

CO5: Acquire Knowledge about types of finishes in textiles.

## Course Mapping

### 22SCCFT3 - WET PROCESSING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO.1	1	3	2	2	-
CO.2	3	1	3	2	-
CO.3	3	3	3	3	2
CO.4	3	3	3	3	2
CO.5	3	3	3	3	2
Average	3	3	3	2	1

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Dept of Fashion Technology &  
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Sri Ram Institute of Design & Technology  
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## **SECOND ALLIED COURSE I**

### **22SACFT3- INDIAN TEXTILES & EMBROIDERY**

#### **Objectives:**

1. To make students to study the origin of Indian textiles and costumes.
2. To understand the origin of traditional embroidery of India.

#### **Unit I Origin of Costumes**

Theories of clothing origin, Invention of needle, Development of sewing, Development of garment styles and Role of costumes. History of Indian Garments from ancient to modern times.

#### **Unit II Traditional Woven Textiles**

Dacca muslin, Jamdani, Chanderi, Baluchar Buttedar, Brocades- Kam Kawab, Paithani, Peethamber, Kancheepuram brocade, Banaras brocade, Himrus and Amrus, Kashmiri shawl.

#### **Unit III Traditional printed and dyed Textiles**

Printed Textiles: Kalamkari. Block printing, Roghan printing and other printed and painted textiles (Mata – mi- pachedi, Pabuji-ka-pad) Dyed Textiles: Ikat, Patola, Bandhani, Laharia, Mashru

#### **Unit IV Embroideries of India**

Kantha of Bengal, Gujarat embroidery, Kasuti of Karnataka, Chamba roomal of Himachal, Pulkari of Punjab, Chikankari of Uttar Pradesh.

#### **Unit V Costumes of India**

Introduction to Traditional Indian dress, Costumes of West Bengal, Assam, Bihar, Uttar Pradesh, Rajasthan, Gujarat, Maharashtra, Punjab, Kashmir, Himachal Pradesh & South India. An introduction to Traditional ornaments of India.

## Course Outcome

CO1: Discover the beginning and origin of costumes, embroidery and printed fabrics of India

CO2: Identify the traditional embroidery, dyed and printed fabrics of India

CO3: Recognize the costumes dyed and printed textiles of India

CO4: Value the traditional costumes, embroideries, dyed and printed fabrics of India

CO5: Appraise the traditional textiles of India.

## Course Mapping

### 22SACFT3- INDIAN TEXTILES & EMBROIDERY

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO.1	3	3	2	1	1
CO.2	2	3	1	1	2
CO.3	2	3	1	1	2
CO.4	3	2	2	2	-
CO.5	3	3	3	2	2
Average	3	3	2	2	1

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Mumbai India - 400015  
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## **CORE COURSE V**

### **22SCCFT5- Boutique Management**

#### **Objectives:**

- 1.Acquire boutique managerial skills
- 2.Understand the intricacies of retail business.
- 3.Apply the managing and start up the boutique business.

#### **UNIT – I INTRODUCTION TO BOUTIQUE:**

Boutique – definition – management Skills required to set up a boutique – identifying target market and customer – selection of boutique name – types of boutique – low- end and high-end boutiques

#### **UNIT – II BOUTIQUE INTERIOR:**

Choice of location and space management – infrastructure requirement – fashion accessories in boutique – boutique interior – visual merchandising – store layout – types of display – exterior display – interior display – tools for visual merchandising – signage – props – mannequins – fixtures and lightings

#### **UNIT – III RESOURCE MANAGEMENT:**

Staffing – selection of generalists and specialists – Customer relationship management – manpower planning – performance management – employee relations

#### **UNIT – IV TOOLS AND MATERIALS:**

Boutique marketing tools and promotional kit – material sourcing – bookkeeping for boutique and maintaining stock.

#### **UNIT – V FINANCIAL MANAGEMENT:**

Project finance – cash control and cash flow analysis – managing and start up the boutique business – boutique visit – boutique project report..

## COURSE OUTCOME

**CO1:** Identify the skills needed to start a boutique

**CO2:** Understand about the boutique interior

**CO3:** Choose the correct management techniques for good customer relationship

**CO4:** Analyze boutique marketing tools and promotional kit

**CO5:** Apply the managing and start up the boutique business.

### Course Mapping

#### 22SCCFT5- Boutique Management

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO.1	3	3	3	2	2
CO.2	2	2	1	2	2
CO.3	2	3	3	3	3
CO.4	2	3	2	3	2
CO.5	2	3	3	2	3
Average	2	3	2	2	2

*B-111*  
2022-2023  
Jagatjit Fashion Technology &  
Creative Designing  
National Institute of Fashion  
Technology - EDU 002

## **CORE COURSE IV**

### **22SCCFT6- TEXTILE TESTING**

#### **Objectives:**

1. To impart knowledge on fibre, yarn and fabric testing.
2. To make the learners understand the working principles of textile testing equipment.

#### **Unit I      Quality control: Definition and its importance.**

Humidity: Definition and its influence on fiber properties Standard atmospheric condition, Standard testing atmosphere. Standard regain, Moisture content and regain. Measurement of atmospheric condition – wet and dry bulb Hygrometer and sling Hygrometer.

#### **Unit II**

Fiber Testing: Fiber length – Baer sorter and Fibrograph, Fiber strength – Stelometer, Fiber fineness – Micronaire, Fiber maturity, Trash content - determination – Trash analyzer.

#### **Unit III**

Yarn testing: Determination of yarn count – quadrant, Analytical & Beesley balance. Twist – Direction of twist and amount of twist, Twist effect on fabric properties. Strength of yarn-Single yarn strength tester. Crimp – Shirley crimp tester. Yarn appearance tester. Evenness – Uster Evenness tester, Hairiness – Uster Hairiness tester.

#### **Unit IV**

Fabric Testing: Fabric strength tester – Tensile strength, tearing strength & bursting strength. Abrasion – Types of abrasion – pilling – Martindale pill box tester.

#### **Unit V**

Drape – Drape meter, Fabric stiffness - Shirley stiffness Tester, crease recovery – Shirley crease recovery tester.

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## Course Outcome

- CO1: Understand about the importance of quality control
- CO2: Acquire knowledge about working of fibre testing instruments
- CO3: Understanding the working principles of yarn testing instruments
- CO4: Explain the working principle for fabric quality checking instruments
- CO5: Acquire Knowledge about fabric handling property testing.

## Course Mapping

### 22SCCFT6- TEXTILE TESTING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO.1	3	3	2	3	1
CO.2	2	2	1	2	2
CO.3	2	2	1	2	2
CO.4	2	2	2	3	2
CO.5	2	2	2	3	2
Average	2	2	2	3	2

If there is no correlation,

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 School of Fashion Design & Merchandising  
 VIT-AP  
 VIT-AP

## **MAJOR BASED ELECTIVE I**

### **22SMBEFT1A- FASHION MERCHANDISING & MARKETING**

#### **Objectives:**

1. To impart knowledge about marketing and merchandising.
2. To understand the role played by the fashion buying offices.

#### **UNIT I**

Introduction to Merchandising, Requirements of a merchandiser, Responsibilities of a merchandiser, merchandising terminology, 6 months merchandising plan-buying calendar

#### **UNIT II**

Types of Merchandising - Export House – manufacturer Exporter-Merchant exporter – Buying house- Buying Agency –Types of Buying agency, Selection of Buyer's & Buying Agency, Functions of merchandiser in an Export house, buying house and buying agency, Importance of LC amendments

#### **UNIT III**

Importance of costing in Apparel industry-elements of costing, fabric construction/GSM calculation, patterning vs. costing, fabric consumption calculation, fabric costing-woven and knits, value added materials in garments, Garment costing-men's style, ladies style, childrens style, shipping charges, trial costing

#### **UNIT IV**

Introduction, Meaning, nature, functions, importance, marketing environment

- Definitions of Marketing, Concept of Marketing,
- Marketing Mix
- Segmentation
- Targeting
- Positioning

Analysis of consumer markets and buyer behaviour, criteria consumers use in fashion selection, Consumer identification with fashion life cycle, Merchandising the fashion life cycle, Understanding consumer behaviour, Role of the Digital marketing (internet): technological development, development of ecommerce, different commercial models and diverse roles of websites.



## UNIT V

Product Mix, Product Life Cycle, New Product Development customer profiles, marketing research methods, test marketing, Types of Resident buying offices, Fashion consultant, trade publications.

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### Course Outcome

CO1:Understand the basic concepts of marketing and fashion merchandising

CO2:Discover the importance of merchandisers and their types

CO3:Explain about the costing procedure in garment industry

CO4:Acquire knowledge about the concepts of pricing strategies

CO5:Evaluate product pricing systems in fashion marketing.

### Course Mapping

#### 22SMBEFT1A- FASHION MERCHANDISING & MARKETING

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

CO \ PO	PO1	PO2	PO3	PO4	PO5
CO.1	3	3	2	2	1
CO.2	2	2	3	2	2
CO.3	2	2	2	3	2
CO.4	2	2	2	3	2
CO.5	2	2	2	3	2
Average	2	2	2	3	2

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2022-2023  
Jagad Guru Fashion Technology &  
Education Designing  
Maharaja Institute of Fashion Designing  
Tiruchirappalli - 620 002

## **MAJOR BASED ELECTIVE I**

### **22SMBEFT1B- Export Documentation**

#### **Objectives:**

- Enable students to know about scope of Fashion Business
- Understand the importance of fashion Communication & forecasting.
- Explain on Fashion communication and visual merchandising.

#### UNIT – I Introduction to Export Market:

Basics of international trade and its significance. Role of WTO and regional economic groups in international trade. International trade statistics of textiles and apparel. Prospects for Indian apparel exports and SWOT analysis.

#### UNIT – II Export Business:

Setting up of export business - export marketing organisation, product planning for export markets, export pricing and costing, International Commercial (Inco) Terms. Export correspondence -negotiations for export business.

#### UNIT – III Trade:

Domestic trade vs international trade, regional trade blocks, nature of foreign exchange market, main functions, business & environment – social & logical. Business.

#### UNIT – IV Document:

Export Procedure, Inspection and Customs Clearance procedures. Shipping formalities. Export Documentation - types - transport documents, commercial documents, and regulatory documents. Marine Insurance General Information on Shipping - Types of Containers - Containerization - Air Transportation. Export Packaging - Introduction - Mechanical tests - Climatic tests - International Care labelling. Negotiation of documents and realization of export proceeds, procedure for obtaining various export incentives.

#### UNIT – V Exim policy:

Exim policy of India. Various schemes for export promotion-duty drawback, duty exemption, duty remission. EOU, free trade zones, special economic zones, market access initiative, market development assistance, brand promotion, trading house, export houses, ware housing zones

## Course Outcome

CO1: Exhibit knowledge on need for exports and export trade statistics

CO2: Demonstrate the need for exports and export trade statistics

CO3: Identify the functions of international trade.

CO4: Demonstrate knowledge in export documentation and procedures in textile trade

CO5: Examine the EXIM policy and export promotion schemes.

## Course Mapping

### 22SMBEFT1B - Export Documentation

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO.1	2	2	2	1	1
CO.2	3	2	2	-	1
CO.3	1	2	2	2	-
CO.4	2	1	-	3	-
CO.5	-	1	2	2	2
Average	2	2	2	2	1

*P. H. K.*  
2022-2023  
Jawahar Education Foundation  
Engineering Designing  
Skillset Inspire Growth Culture  
Tiruchirappalli - 620 002

**SKILL BASED ELECTIVE**  
**22SSBEFT1 -FASHION**  
**BUSINESS**  
**(Theory)**

**OBJECTIVES:**

- Learn the basic concepts and terms in fashion business
- Understand the importance of fashion communication and forecasting.
- Explain the role of fashion communication and visual merchandising in fashion business

**UNIT – I FASHION COMMUNICATION FASHION:**

Communication Process, Need of fashion communication in fashion industry. Problems and Networks. Fashion Verbal Communication. Language as a vehicle of communication, Non-Verbal Communication.

**UNIT – II INTER PERSONAL COMMUNICATION:**

Study and practical of inter-personal, small group and presentation skills essential to effective social, business and professional interaction. Fashion Communicative devices in commercial publicity: letter styles, designs, pictorial presentation, slogans, colour variations.

**UNIT – III CULTURAL AND INTER CULTURAL COMMUNICATION:**

Cultural and intercultural communication theory and behavior, development of specific communication skills for effective inter-cultural communication.

**UNIT – IV FASHION FORECASTING & VISUAL MERCHANDISING:**

Fashion Forecasting – Need for forecasting – Forecasting agencies – Role of forecasting agencies – Fashion direction and recent trends. Visual Merchandising: Design strategy, fashion styling, publication design, prop design, set design.

**UNIT – V FASHION BUSINESS:**

Business of fashion, Scope, forms of business ownership, growth and expansion. Industry trends, Market weeks, Trade shows, Development of regional fashion centers, Fashion advertising

## Course Outcome

CO1: Apply Various effective communication methods between buyer & consumer

CO2: Develop interpersonal communication skills for fashion business

CO3: Compare inter & intra cultural environment in Fashion business.

CO4: Understand the methods used in fashion forecasting

CO5: Analyse various levels of fashion business

## Course Mapping

### 22SSBEFT1 - FASHION BUSINESS

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO.1	1	2	3	2	-
CO.2	-	2	1	2	2
CO.3	2	3	2	3	2
CO.4	3	3	2	2	2
CO.5	2	2	3	3	2
Average	2	2	2	2	2

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# SHRIMATI INDIRA GANDHI COLLEGE

Nationally Accredited at "A" Grade (Cyclical) by NAAC

An ISO 9001:2015 Certified Institution

Tiruchirappalli - 620 002

## PG & RESEARCH DEPARTMENT OF MICROBIOLOGY

### PROGRAMME OUTCOME:

- Gain advanced knowledge of applied biological sciences and microbial biochemical nature as to enable them find solutions for complex molecular functions and physiology.
- Graduates and their microbial natural recycling knowledge would contribute towards the improvement of soil quality and agricultural output through sustainable microbiological applications.
  - Shine as an entrepreneur by using microbes as biofertilizers and biocontrol agents, microbial by-products as pharmaceutically potent molecules and microbes as nutritionally rich sources of food.
- Create self-confidence to develop an entrepreneurship avenue by providing technical and entrepreneurship skills. Skill focused lab courses would highly assist in disease diagnosis, treatment and prevention.
- Understanding of human ethical principles and responsibilities, moral and social values in personal life would bring out a culturally rich and civilized personality.

## CORE COURSE I GENERAL MICROBIOLOGY

### COURSE OBJECTIVES

To introduce the beginners to the microbial arena as well as to orient them on the fundamental equipments, tools and techniques required for a primary but, a strong understanding of microbes.

To impart the knowledge of different methods of classification of bacteria, viruses, fungi & others.

To provide unique characteristic features of microbes.

To describe the different types of microscopy and their working principles.

To explain about microbial media, preservation and control techniques.

### UNIT - I INTRODUCTION:

Spontaneous generation, conflict - contributions of early microbiologists: Leeuwenhoek, Louis Pasteur, Robert Koch, Edward Jenner & Winogradsky. Bacteria: Cell walls of Gram negative, Gram positive, and L-forms. Cell wall synthesis. Structure and mechanism of movement of flagella - Pili and fimbriae: types, structure and their role. External cell surface structures: capsule, glycocalyx, slime layer and S-layer. Brief account on gas vesicles, chlorosomes, carboxyomes, magnetosomes, phycoblasts & PHB.



# SHRIMATI INDIRA GANDHI COLLEGE

Nationally Accredited at 'A' Grade (C) Cycle by NAAC

An ISO 9001:2015 Certified Institution

Tiruchirappalli - 620 002

## **UNIT – II MICROSCOPY AND MICROBIAL TAXONOMY:**

Principle, working & applications of Bright field, Dark field, Phase Contrast, Fluorescence, Confocal scanning microscope and Electron (TEM,SEM) microscopes. Microbial Taxonomy - Definition and systematics, Nomenclature and identification. Classification of microorganisms & its basis - Haeckel's threekingdom concept, Whittaker's five kingdom concept and Three domain concept of Carl Woese. Major characteristics used in taxonomy – morphological, physiological, metabolic, serological and molecular. Classification and salient features of bacteria according to Bergey's Manual of Determinative Bacteriology - Ninth edition. Numerical taxonomy - 16S rRNA based classification

## **UNIT – III CLASSIFICATION AND BASICS OF FUNGI AND VIRUSES:**

Alexopoulos & Mims Classification of fungi - characteristics of fungi – Filamentous, non- filamentous and dimorphic fungi -Morphology, structure and life cycle of *Aspergillus niger* and *Saccharomyces cerevisiae*. Parasitism, mutualism and symbiosis with plants and animals. Viruses: ICTV system of classification, General properties, Morphology, viral capsids and their arrangements, viral envelopes and their composition, viral genome (RNA, DNA); Viroids, Prions - structure and importance.

## **UNIT – IV CLASSIFICATION AND BASICS OF ALGAE AND PROTOZOA:**

Fritsch system of algal classification – General characters of Blue-green Algae (Cyanobacteria) - Structure and reproduction of *Chlamydomonas* sp. - Macroalgae - Biological and Economic importance of algae. Protozoa – modified form of Levine classification & characteristics - Structure and reproduction of *Paramecium* sp.

## **UNIT – V METHODS OF MICROBIAL CULTURE, PRESERVATION AND CONTROL:**

Isolation of different types of bacteria - Fungi – Actinomycetes - Cyanobacteria - Protozoa. Physical and Chemical requirements for growth; Pure culture methods. Anaerobic culture techniques. Preservation methods of microbes. Type culture collections. Physical and chemical methods of controlling microorganisms.



# SHRIMATI INDIRA GANDHI COLLEGE

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UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Cultivable and uncultivable microbe importance for evolutionary studies.

Preparation of power point presentations (ppts) or charts representing a topic of the course and their seminar presentations – chart preparations and presentations covering equipments/ tools of the course & their display - Quiz classes – discussion of previous semester question papers.

## P22MBCC11 - CO - PO - Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	1
CO2	3	3	3	3	3
CO3	3	2	1	2	3
CO4	3	1	1	3	3
CO5	3	2	3	2	1
Optimum Point	3	2	2	3	2

  
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## CORE COURSE II BIOLOGICAL MACROMOLECULES

### COURSE OBJECTIVES:

- To educate the structure and functions biological molecules.
- To know the interrelationship between various biomolecules and consequences of any deviation from normal.
- To understand the structure and functions of blood, hormones and phytohormones.
- To study the basic metabolic regulators' characteristic features.
- To understand the interrelationships among biological energy, functions and health.

### UNIT - I CARBOHYDRATE, PROTEINS AND AMINO ACIDS:

Carbohydrate: Definition, sources, classification, structure of glucose, biological significance, digestion and absorption. Proteins: Definition, sources, classification and structure of proteins (Primary, secondary, tertiary), Amino acids—structure- classification - essential and nonessential, protein and non-protein amino acids.

### UNIT - II LIPIDS, FATTY ACIDS AND NUCLEIC ACIDS:

Lipids: Definition, sources, classification, structure, properties and functions, Fatty acids-saturated, unsaturated and essential fatty acids. Nucleic acids: Definition, structure, forms and functions of DNA. Types, structure and functions of RNA (mRNA, tRNA, rRNA).

### UNIT – III HORMONES:

Hormones: Definition, classification of hormones, Human- Endocrine glands – Pituitary, thyroids, Para thyroid, pancreas, adrenal, testis and ovary. Phytohormones: Structure and functions of auxin, gibberellins, cytokinins and abscissic acid.

### UNIT – IV VITAMINS AND MINERALS:

Vitamins – Definition, sources, deficiency syndromes and functions of Fatsoluble vitamins (A, D, E and K) and Water-soluble vitamins (B complex and C). Minerals Zn, Ca, Iodine, Fe, and Mg.

### UNIT – V BLOOD AND PIGMENTS:

Blood: Introduction, origin, composition, characterization, functions and coagulation of blood. General account and secondary metabolites. Major and accessory microbial pigments – chlorophylls, carotenoids, phycobilins and anthocyanins.

### UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Diseases associated with deficiency of endocrine hormones- hypo and hyper secretions.  
Life style diseases and metabolic diseases. Dietbiochemical- health. Food as drug.



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## P22MBCC12 – BIOLOGICAL MACROMOLECULES- MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3
CO2	3	1	2	2	3
CO3	2	2	2	2	3
CO4	2	2	1	2	2
CO5	2	2	2	2	2
Optimum Point	3	2	2	2	3

  
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## CORE CHOICE COURSE I APPLIED BIOLOGICAL SCIENCES

### COURSE OBJECTIVES:

- To enable the students to understand the basic components of biology.
- To understand the biological diversity, uniqueness and their characteristic features.
- To study the importance of biological sciences in human welfare.
- To educate about the farm animals developmental principles and essential qualities.
- To create an awareness as to ensure nature based activities and minimize usage of experimental animals.

### UNIT - I ALGAE AND FUNGI:

Thallophytes: Algae-General characteristics- Economic importance Types of life cycle- Outline of various classifications. Fungi: General characteristics- Classifications and Economic importance

### UNIT - II CRYPTOGAMIC PLANTS:

General characteristics- Economic importance and outline of reproduction methods in Lichens, Bryophytes, Pteridophytes and Gymnosperms. Stellar evolution

### UNIT - III PHANEROGAMIC PLANTS:

Salient features of monocot and dicot. Taxonomy: Systems of classification, (Artificial, Phylogenetic and Natural). Morphometric diversity: Morphology; types of inflorescences. Technical description of flower and floral diagram and types of fruits. Economic importance.

### UNIT - IV INVERTEBRATES:

General characteristics and outline classification up to classes in Protozoa, Porifera, Coelenterata, Platyhelminthes, Aschelminthes, Annelida, Arthropoda and Echinodermata; Economic importance of invertebrates. General characters - a brief study on Star fish.

### UNIT - V VERTEBRATES:

Classification of Chordata – General characteristic features and Classification (up to the orders) – Prochordata, Pisces, Amphibia Reptilia, Aves and Mammalia- Economic importance of Vertebrates. Farm animals – Controlling of breeding animals.

### UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Bioluminescence. Principles of insect control: physical, mechanical, chemical, biological and integrated methods of pest control. Cell cultures and line lines.



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## P22MBCC1A-Applied Biological Sciences-Mapping

1:Slight(Low) 2:Moderate(Medium) 3:Substantial(High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	1	-	1	-	1
CO3	2	1	1	1	-
CO4	1	-	-	1	-
CO5	2	1	-	3	2
Optimum Point	2	1	1	2	1

  
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## CORE CHOICE COURSE I

### 2. MOLECULAR TAXONOMY AND PHYLOGENY

#### COURSE OBJECTIVES:

- To gain the knowledge of microbial taxonomy and molecular phylogeny
- To explore the sources of information for phylogenetic analysis
- To know about recent techniques of sequencing, sequence analyses and fingerprinting
- To grasp the speed of technological change in molecular biology and their impact on phylogenetic research
- To study about evolutionary origin and their importance.

#### UNIT - I MICROBIAL TAXONOMY:

Introduction to microbial taxonomy – morphological, Biological Classification, Three Domain concept, biochemical and molecular taxonomy. Basic concepts of numerical taxonomy. Positive and negative aspects of each taxonomical methods. Morphological phylogeny.

#### UNIT - II BIOCHEMICAL AND MOLECULAR TAXONOMY:

Chemotaxonomy - fatty acid, protein finger printing, Isozyme typing, pigments and polyamines. Biochemical phylogeny. Molecular taxonomy - G +C content, DNA –DNA hybridization, DNA – RNA hybridization, Plasmid profiles, RFLP, RAPD, AFLP, STRR and LTRR, REP –PCR, rRNA based DNA finger printing methods.

#### UNIT – III 16S rRNA BASED FINGER PRINTING:

Types of rRNA - 23s rRNA, 16S rRNA and 5S rRNA. Isolation of DNA, amplification of 16S rDNA using PCR technique, Cloning, transformation, Blue-white screening, Dot Blot/Southern blot hybridization using specific Probes. Sequencing of 23s rRNA, 16S rRNA and 5S rRNA. Importance of 16S rRNA in identification of prokaryotes. Methods of 16S rRNA / rDNA fingerprinting.



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## UNIT – IV SEQUENCE SUBMISSION AND ANALYSIS:

Submission of rDNA sequences in GenBank – BankIt and Sequin guidelines. NCBI, EMBL, PDB and DDBJ – retrieving sequences. RNA structure prediction, Restriction enzyme patterns. Ribosomal Database Project - Designing primers and probes. Sequence comparison, alignment and data base searching – ClustalW, FASTA and BLAST. DNA barcoding.

## UNIT – V MOLECULAR PHYLOGENY:

Introduction to Molecular phylogeny – tree terminology, software programs for making phylogenetic trees – MEGA, Phylip, RAPDistance. Cladogram, additive trees and ultrametric trees, rooted, unrooted trees and tree shapes.

## UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Field trip and Hands on training on Sample collection – algae, lichen, etc. – monitoring algae diversity. Hands on about microalgae identification using manuals – program content free hand drawing of algae, cyanobacteria, lichen, bacteria's – phylogeny tree making using Clustal W and/or MEGA softwares.



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## P22MBCC1B- Molecular Taxonomy and Phylogeny -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	2	2	1	1	1
CO3	1	1	1	2	1
CO4	2	1	1	1	1
CO5	2	1	2	1	1
Optimum Point	2	1	1	1	1

  
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## CORE PRACTICAL I GENERAL MICROBIOLOGY & BIOLOGICAL MACROMOLECULES GENERAL MICROBIOLOGY

### COURSE OBJECTIVES:

- To educate hands-on skills on the first-line experimental methods of the fundamental microbiology.
- To deepen students' understanding on the importance of lab sterility.
- To understand sterilization and decontamination procedures as to maintain a good microbiology laboratory.
- To provide a better practice on various media preparation and pure culture methods.
- To describe assessment of microbes using microscopes after staining.

### EXPERIMENTS:

1. Sterility control test
2. Principles and methods of sterilization, decontamination and laboratory fumigation, Preparation and use of glassware cleaning solutions.
3. Staining and direct microscopic observations of bacterial shape cocci, rods and chains; fungal spore- mycelium, yeast budding
4. Preparation of media: Liquid and Solid media, Agar deep, slant and plate and soft agar
5. Pure & axenic culture techniques - serial dilution - pour plate, spread plate, streak plate methods, decimal dilution and stab culture techniques
6. Bacterial Staining methods - simple, Gram's, acid fast, flagella, capsule and spore.
7. Fungal Staining methods - Lacto-phenol cotton blue
8. Motility of bacteria - Hanging drop and soft agar inoculation
9. Enumeration of microorganisms from soil: Bacteria, Fungi and Actinomycetes, total count (Haemocytometer)
10. Isolation and purification of cyanobacteria, actinomycetes and fungi
11. Phenol Co-efficient test.
12. Micrometry – counting & measurements of microbes

## BIOLOGICAL MACROMOLECULES

### COURSE OBJECTIVES:

- To understand the biological macromolecules' types and structures.
- To provide hands- on experience on analytical techniques.
- To describe the principles of analytical agents in confirmation tests.
- To teach the estimation procedure for biochemical test
- To motivate towards innovative findings in microbial molecular mechanism.





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## EXPERIMENTS:

1. Carbohydrate reducing sugars-Anthrone method/Benedicts method.
2. Aminoacids-Ninhydrin method
3. Protein–Lowry’s method/Biuret method/ Bradford assay
4. Estimation of Cholesterol-Acetic anhydride method,
5. Estimation of lipid.
6. DNA-Diphenylamine method
7. RNA-Orcinol method
8. Determination of Phosphorous content of nucleic acids-Perchloric acid test.
9. Pigments (Chlorophyll-Carotenoids–Phycobili Proteins)– Spectrophotometric
10. Estimation of Vit. C concentration by DCPIP method Estimation of haemoglobin on Blood
11. Immobilization of cell: RBC
12. Determination of A/G ratio in serum

## P22MBCC1P – General Microbiology & Biological Macromolecules Practical - Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3
CO2	3	2	3	3	3
CO3	3	2	3	2	2
CO4	2	2	3	2	2
CO5	3	2	3	1	3
Optimum Point	3	3	3	2	2

  
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## ELECTIVE COURSE I 1. BIOLOGICAL TECHNIQUES

### COURSE OBJECTIVES:

- To become familiar with microscopic techniques
- To develop the skills as to understand the theory and practice of bio analytical techniques.
- To elaborate the applications of spectroscopic methods in biology
- To attain knowledge on purification of macromolecules using various biological techniques.
- To update with the current knowledge of molecular techniques.

### UNIT - I MICROSCOPIC TECHNIQUES:

Components of microscopes - Basic principles and methods of Bright field, Dark field, Phase contrast, Fluorescence, Polarization and confocal microscopes. Electron Microscopy – Principle, Techniques and applications of Transmission Electron microscope (TEM), Scanning Electron Microscope (SEM) and Atomic Force Microscope (AFM). Microtomy – Basic and Freezing microtome – specimen preparation.

### UNIT - II ANALYTICAL TECHNIQUES SPECTROSCOPIC METHODS:

UV- Visible, Atomic Absorption Spectrophotometer, Atomic Emission Spectroscopy. Centrifugation – Principle, types and applications. Electroanalytical methods- Potentiometric, Conductimetric, Coulometric and Voltametric analyses. Biosensors. Principles of radioactivity, GM and LS counter.

### UNIT - III CHROMATOGRAPHIC TECHNIQUES:

Chromatography - Paper, Thin layer, Ion exchange, affinity and gel permeation - Principle, preparation of columns, adsorption and elution. GC, GC - MS and HPLC - principle and their applications.

### UNIT - IV ELECTROPHORESIS AND ITS APPLICATIONS:

Electrophoresis – Principle and applications of Agarose and Pulse field gel electrophoresis, counter current and rocket immune-electrophoresis, SDS-PAGE and 2D gel electrophoresis.

### UNIT - V MOLECULAR TECHNIQUES:

Isolation and quantification of nucleic acid – DNA, RNA and Plasmids. Amplification of DNA - Polymerase chain reaction and Real time and reverse transcriptase PCR. Gene cloning techniques – Restriction digestion and phosphatase treatment of cloning vectors. Gene transfer mechanisms – chemical and electroporation. Method of detection of clones–colony hybridization, Blue - White selection and immunochemical detection.

### UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Students may undergo internship training program to become expertise in 15 handling instruments like SEM, TEM, HPLC, GC-MS etc. Self-reading, assignment, seminar, quiz, group discussion, posters on recent advances in biological techniques.



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## P22MBE1A - Biological Techniques –Mapping

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3
CO2	2	2	3	1	1
CO3	1	1	1	1	1
CO4	2	1	1	1	1
CO5	1	1	1	1	1
Optimum Point	1	1	1	1	1

  
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## ELECTIVE COURSE II FOOD AND DAIRY MICROBIOLOGY

### **COURSE OBJECTIVES:**

- To enable the students to imbibe essential knowledge in key concepts of food and dairy microbiology
- To understand various methods of food fermentations and fermented food products.
- To portray the conceptual basis for understanding probiotics.
- To impart an awareness about microbial illness in foods, food sanitations and other related aspects.
- To provide the skills of preparing fermented milk products.

### **UNIT - I FOOD AND MICROBES:**

Types of microorganisms in food – Bacteria, molds, yeast and protozoa. Source of contamination- Factors influencing microbial growth in food- pH, moisture, oxidation – Reduction potential, Nutrient content and Inhibitory substances and biological structure.

### **UNIT - II FOOD FERMENTATION AND FERMENTED FOOD PRODUCTS:**

Food fermentations: methods of fermentations and organisms used -Cheese, bread, wine, beer. Fermented vegetables. Food and enzymes from microorganisms - single cell protein and mushrooms. Prebiotics, Probiotics and symbiotics. Advantages of probiotics. Contamination, spoilage and preservation of cereals and cereals products, sugar and sugar products, vegetables, fruits, meat and meat products, Fish and other sea foods, egg and poultry, dairy and fermentative products.

### **UNIT - III FOOD BORNE DISEASES AND CONTROL:**

Food borne diseases and food poisoning. General principles underlying food spoilage and contamination – Staphylococcus, Clostridium, Escherichia coli and Salmonella infections, Hepatitis, Amoebiasis and Mycotoxins. Spoilage in canned foods. Food sanitation and control measures, HACCP, GMP, GLP.

### **UNIT – IV FOOD PRESERVATION METHOD:**

Food preservations: principles- methods of preservations- Physical and chemical methods. Canning: classification of can, structure of cans, canning of food items, Thermal process time calculations for canned foods.

### **UNIT – V DAIRY MICROBIOLOGY:**

Microbes in milk, sources of contamination, microbiological changes in milk during production and processing. Starter cultures- lactic acid bacteria. Fermented milk products- dahi, lassi, yoghurt, cultured buttermilk, kefir, cheese. Microbiological standards and quality of dairy products- cream, butter, dried and evaporated milk, sweetened condensed milk, frozen dairy products and indigenous dairy products.

### **UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):**

To enrich knowledge on the production, processing and preservation of foods and food products Learners may visit food / dairy industry and shall submit a report. May prepare fermented food in groups or individual.



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## P22MBE1B – FOOD AND DAIRY MICROBIOLOGY MAPPING

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2
CO2	3	3	3	3	2
CO3	3	3	3	3	2
CO4	2	3	2	3	2
CO5	2	3	2	3	2
Optimum Point	3	3	3	3	2

  
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## VALUE ADDED COURSE I MEDICAL LABORATORY TECHNOLOGY

### **COURSE OBJECTIVES:**

- To teach conventional methods of disease diagnosis and their moderation in the current era.
- To provide the knowledge of collection and processing of clinical samples
- To study the pathogenic microbial culture and their identification techniques.
- To give awareness of how to manage and dispose the biomedical waste.
- To strengthen the learners with the knowledge of current diagnostic methods including molecular methods required to secure a profession/career in health care sectors.

### **UNIT - I LAB TECHNOLOGIST, SOLUTIONS AND MEASUREMENTS:**

Medical lab technologist: role, responsibility & ethics to be followed - types of hazards and laboratory accidents – first aid and safety measures to be followed. Preparation of normal, molar, percent & buffer solutions, dilutions, w/v, v/v, standard and aqueous solutions, concepts of acid and base. Units of measurement: SI Unit, reference range, conversion factor, Units for measurement of bio metabolite, enzymes, protein, drugs, hormones, vitamins.

### **UNIT - II CLINICAL SPECIMENS AND TESTING:**

Clinical specimen collection and processing: Blood, Urine, Stool and & other body fluids - normal & abnormal constituents. Semen analysis - Hyper & hypoglycemia - Diabetes mellitus, Histopathology: Tissue Processing - Fixing, Embedding, Microtomy, Staining, mounting, decalcifications.

### **UNIT - III MICROBIAL CULTURE & IMMUNOLOGICAL:**

Microbial culture techniques, Bacterial & Fungal culture media & their uses, Antibiotic sensitivity test, Diagnostic test for HIV, Hepatitis B, Hepatitis C, Malaria, Tuberculosis. WIDAL, RPR, CRP, Pregnancy test, Stool examination- Identification of different ova & cysts.

### **UNIT - IV SEROLOGY AND LAB AUTOMATION:**

Liver, Renal functions & their assessment, Jaundice, its types and their biochemical findings, Blood urea estimation, Serum uric acid, total protein, albumin, globulin, glucose, total, HDL LDL cholesterol, Triglyceride, Bilirubin total estimation, Serum SGOT, SGPT estimation, Clinical enzymology - automation of microbiology labs: merits and impediments.

### **UNIT - V ENDOCRINOLOGY AND BIOMEDICAL WASTES:**

Hormones of the Thyroid gland- chemistry and normal physiology, Thyroid test. Hormones of the gonads- Estimation of fertility hormones: FSH, LH, Beta-hCG, Progesterone. Cancer – Estimation of cancer marker: PSA & Pap smear test for cervical cancer. Drug abuse screening. Biomedical waste management.



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## UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

A visit to a diagnostic laboratory and a hospital/primary health center –  
semester end internship for ‘one day’ at a hospital or a clinical laboratory –  
seminar classes on molecular methods of diagnosis like PCR - assignments  
submission on result interpretation of various diagnostic tests - Quiz classes -  
short seminar presentations after internship – debates on biomedical waste management –  
discussion of previous year question papers.

### P22MBVAC1 – MEDICAL LABORATORY TECHNOLOGY - MAPPING

1:Slight (Low) 2:Moderate(Medium) 3:Substantial(High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	3	3	3	2
CO3	3	3	3	3	2
CO4	3	2	2	2	2
CO5	3	2	2	2	2
Optimum Point	3	3	3	3	2

  
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## **CORE COURSE III MICROBIAL PHYSIOLOGY AND METABOLISM**

### **COURSE OBJECTIVES:**

- To provide the learners a strong base of bacterial cell physiology so as to impart them with the principal knowledge of functions of bacterial organelles.
- To describe the anabolic and catabolic sections of metabolism deeply.
- To impart the knowledge of extremophilic organisms and their merits.
- To understand metabolic processes of energy substrates.
- To teach unique physiological features like methanogenesis, bioluminescences and quorum sensing.

### **UNIT - I BACTERIAL CELL STRUCTURE AND FUNCTION:**

Ultrastructure of and differences between Prokaryotic and Eukaryotic cells – Exopolysaccharides, cytoplasmic membrane, Capsules, pili, fimbriae, Slime layer of prokaryotes. Bacterial cell wall - Biosynthesis of peptidoglycan - outer membrane, teichoic acid. Electron carriers – artificial electron donors – inhibitors uncouplers – energy bond – phosphorylation.

### **UNIT - II MICROBIAL NUTRIENTS AND GROWTH:**

Common nutrient requirements, Growth factors - nutritional groups/ types - Bacterial growth - Phases of growth curve – measurement of growth – calculations of growth rate – generation time – synchronous growth – induction of synchronous growth, synchrony index – factors influencing growth – Uptake of nutrients by the cell – Facilitated diffusion – Active transport – Group translocation, Iron uptake - Pinocytosis and Phagocytosis. Survival at extreme environments – starvation – Extremophiles: adaptative mechanisms in thermophilic, alkalophilic, osmophilic and psychrophilic organisms.

### **UNIT - III PHOTOTROPHY AND CHEMOLITHOTROPHY:**

Autotrophs - photosynthetic bacteria and green algae – heterotrophs – bacteria, fungi, myxotrophs. Photosynthetic and accessory pigments: Chlorophyll, bacteriochlorophyll, carotenoids, phycobilliproteins, fluorescence, phosphorescence, rhodopsin, Oxygenic and anoxygenic Photosynthesis– Autotrophic generation of ATP. Fixation of CO<sub>2</sub>. – C<sub>3</sub>, C<sub>4</sub> pathways. Chemolithotrophy – Sulphur, Iron, Hydrogen, Nitrogen oxidations. Physiology and regulation - methanogenesis, bioluminescences and quorum sensing.

### **UNIT - IV CARBOHYDRATE METABOLISM AND FERMENTATION:**

Glycolytic pathways – Embden – Meyerhoff pathway - the pentose phosphate pathway – the Entner Douderoff pathway – the tricarboxylic acid cycle – glyoxyate cycle. Electron Transport Chain. Substrate level phosphorylation – Oxidative phosphorylation & ATP synthesis – reverse TCA cycle – gluconeogenesis – lipid catabolism – beta oxidation. Anaerobic respiration – sulfur compounds – nitrate and carbon dioxide as electron acceptors. Homo and heterolactic acid fermentations. Fermentation by Ruminococcus albus





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## UNIT - V NITROGEN METABOLISM & BACTERIAL SPORULATION:

Biological nitrogen fixation – nitrogenase enzymes – structure and properties – ‘nif’ gene – regulation – functions. Assimilation of inorganic nitrogen – nitrate, nitrite – dinitrogen – ammonia. Cell division – endospore – structure – properties – germination. Microbial sporulation and morphogenesis: Bacteria including cyanobacteria and actinobacteria, fungi and algae.

## UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Chart preparation showing bacterial cell structure and functions of each part, biochemical pathways of Phototrophy and chemolithotrophy, Carbohydrate metabolism and Fermentation, and Nitrogen metabolism & bacterial sporulation - preparation of a biofertilizer using any one nitrogen fixing organism and a locally available carrier material - Quiz classes - short seminar presentations on the prepared charts.

### P22MBCC21– Microbial Physiology and Metabolism Mapping

1: Slight (Low) 2: Moderate (Medium) 3:Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	2	1
CO2	3	3	3	3	1
CO3	3	3	3	3	1
CO4	3	3	2	2	1
CO5	3	3	2	2	1
Optimum Point	3	3	3	3	1

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An ISO 9001:2015 Certified Institution

Tiruchirappalli - 620 002

## CORE COURSE IV MEDICAL MICROBIOLOGY

### COURSE OBJECTIVES:

- To make the students understand various attributes which make the microbes pathogenic or disease-causing, the emergence of newer pathogens with relevance to India and various routes of local or global spread.
- To learn the mechanisms of resistance of bacteria to antibiotics and role of newer vaccines in controlling infectious diseases.
  - To describe the molecular diagnostic methods and automated equipments used for diagnosis of diseases caused by microorganisms.
- To understand the common infections and diseases of medical importance, their microbial causes and pathogenic action.
- To understand the fungal and protozoan diseases and their preventive measures

### UNIT - I INTRODUCTION TO MEDICAL MICROBIOLOGY:

Significance of Microbiology in Medicine. Koch Postulates and Molecular Koch's postulates - Classification of medically important microbes - Normal microbial flora of the human body-Host bacterial interactions – Transmission, attachment, entry mechanisms, microbial pathogenicity. Virulence factors of bacteria. Quantitative measures of pathogenicity: minimal lethal dose (MLD), LD50, ID50, TCID50. Nosocomial and community acquired infections - investigation of epidemic diseases. Type three secretion system (TTSS, T3SS), Role of biofilms and quorum sensing in microbial pathogenicity.

### UNIT - II MEDICAL BACTERIOLOGY:

Morphological, cultural and biochemical characteristics of and epidemiology, pathogenesis, lab diagnosis, prophylaxis and control of medically important diseases caused by: Staphylococcus aureus, Streptococcus pyogenes, Corynebacterium diphtheriae, Clostridium tetani, Bacillus anthracis, Leptospira interrogans, Treponema pallidum, Mycobacterium tuberculosis, Escherichia coli, Vibrio cholerae, Niesseriae, Haemophilus influenza, Helicobacter pylori, Pseudomonas and Salmonella. Zoonotic bacterial pathogens, Antibiotic susceptibility test: Kirby – Bauer disk diffusion method. General methods of Bacterial diagnosis.

### UNIT - III MEDICAL MYCOLOGY:

Morphological and cultural characteristics of and epidemiology, mechanism of fungal pathogenesis, lab diagnosis and treatment of medically important diseases caused by: Superficial mycosis – Tinea versicolor. Cutaneous mycoses: Microsporum, Trichophyton, Epidermophyton. Subcutaneous mycoses: Sporotrichosis, Chromoblastomycosis, Zygomycosis. Systemic Mycoses – Histoplasma 24 capsulatum, Blastomyces dermatitidis, Cryptococcus neoformans, Coccidioides immitis, Paracoccidioides brasiliensis. Opportunistic mycoses: Candidiasis, Cryptococcosis and Aspergillosis. Antifungal susceptibility testing.



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## **UNIT - IV MEDICAL VIROLOGY:**

General properties of and epidemiology, pathogenesis, lab diagnosis and treatment of medically important viral diseases - Influenza, Measles, Mumps, Rubella, monkey pox, Chicken Pox, Poliomyelitis, HIV, Rabies, Yellow fever, Dengue, Covid-19 and Japanese Encephalitis. Brief note on oncogenic viruses. Emerging viral diseases - Antiviral drugs, antiviral vaccines.

## **UNIT - V MEDICAL PARASITOLOGY AND EMERGENCE OF ANTIBIOTIC RESISTANT PATHOGENS:**

Morphology of, and pathogenesis, laboratory diagnosis and treatment of medically important protozoan diseases caused by: Entamoeba histolytica, Giardia lamblia, Trichomonas vaginalis, Plasmodium vivax, Leishmania donovani, Taenia solium, Ascaris lumbricoides, Ancylostoma duodenale and Wuchereria bancrofti. Diagnosis of parasitic infection using clinical samples. Role of Nucleic acid probes in diagnostic microbiology.

## **UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):**

Survey of dermatophytic infections in student's communities. Analysis of worm infections in animal and human stool samples. Daily news and research paper collection and recording of recent outbreak of bacterial, fungal, viral, protozoan diseases. Universal Immunization Programme (UIP) and IAP. Making awareness and celebration of world AIDS day, World TB, cancer Day, Pulse polio immunization day etc., awareness programme on personal hygiene and vaccination.



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## P22MBCC22-Medical Microbiology- MAPPING

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	3	3	3	2
CO3	3	3	3	3	2
CO4	3	3	3	3	2
CO5	2	2	2	2	2
Optimum Point	3	3	3	3	2

  
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## CORE CHOICE COURSE II

### 1. BIOINFORMATICS AND BIOSTATISTICS

#### COURSE OBJECTIVE:

- To develop an expertise in biological website.
- To gain insights about computer-based technology for the study of biological molecules.
- To equip with statistical skills as to solve biological problems.
- To know about protein sequencing, nucleic acid sequencing methods and their analyses.
- To find proteins and their interaction, activity, modification and function.

#### UNIT - I BIOLOGY AND COMPUTER:

Basics of computers –types, servers, operating systems, UNIX, Linux. Finding scientific articles – PubMed – Public Biological databases, search engines. - Applications of Bioinformatics field of biology and medicine.

#### UNIT - II GENOMICS:

Biological databases NCBI, EMBL, DDBJ – sequencing genomes - sequence assembly- pairwise sequence comparison - BLAST and FASTA. Multiple sequence alignments, Phylogenetic alignment – Phylip – profiles and motifs – annotating and analysis of genome sequences – sequence queries against biological databases.

#### UNIT - III PROTEOMICS:

Protein Data Bank, Swiss- prot – PIR, SCOP, CATH – predicting protein structure and function from sequences - secondary structure prediction – Chou Fassman, GOR method -predicting 3 D structure – protein modeling, abinitio - visualization tool RASMOL.

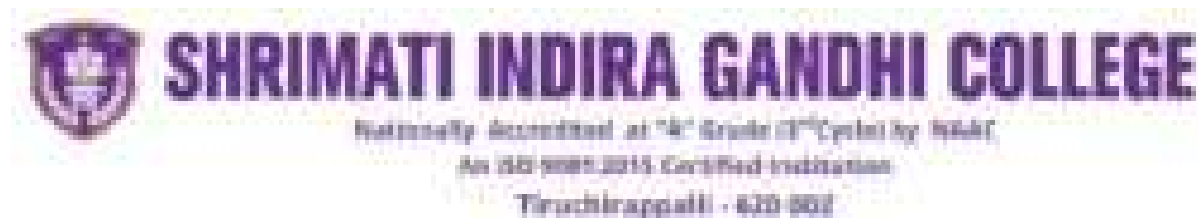
#### UNIT – IV BIOSTATISTICS I. DATA AND DESCRIPTIVE STATISTICS:

Introduction – Population and sample – Variables – Collection and presentation of data – Descriptive statistics - Measures of Central tendency – Mean (arithmetic, harmonic and geometric) Median and Mode – Measures of dispersion – range, mean deviation, variance and standard deviation. Skewness and kurtosis.

#### UNIT – V BIOSTATISTICS II. PROBABILITY AND VARIANCE TESTING:

Inferential statistics – Probability and distributions – Poisson, Binomial and Normal distribution –

Chi square test – Hypothesis test – Student's test – Correlation and Regression – ANOVA.



UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Literature seminar on bioinformatics and biostatistics. Learn on how the application of computers, make ease of these two courses with the advancement. Give a work to the students to know about best statistical software and bioinformatics databases and tools available. Demonstration of various software available with the institute.

**P22MBCC2A- Bioinformatics and Biostatistics -Mapping**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1
CO2	2	2	2	2	2
CO3	3	3	3	3	2
CO4	2	2	2	2	2
CO5	2	2	2	2	2
Optimum Point	3	3	3	3	2

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## **CORE CHOICE COURSE II PHARMACEUTICAL MICROBIOLOGY**

### **COURSE OBJECTIVES:**

- To provide the basics of antimicrobials with special reference to antibiotics and antifungals.
- To present antimicrobials' assessment procedures along with sterilization, sterility testing of various pharmaceutical products.
- To impart production and quality control of prophylactic compounds.
- To teach methods of controlling pharma products microbial contamination and role of cell culture in pharmacy.
- To bring an awareness about antimicrobial resistance.

### **UNIT - I ANTIMICROBIALS, TYPES AND ACTION MECHANISMS:**

Antibiotics-Natural and synthetic - antifungal agents, Peptide antibiotics, Chloramphenicol, Sulphonamides and Quinolone antimicrobial agents. Chemical disinfectants, antiseptics and preservatives - Laboratory evaluation of antimicrobial agents - Mechanism of action of antibiotics and synthetic anti-infective agents - Clinical uses of antimicrobial drugs.

### **UNIT - II DRUG DELIVERY AND DELIVERY SYSTEMS:**

Molecular principles of drug targeting. Drug delivery system in gene therapy Bacterial resistance to antibiotics. Mode of action of non-antibiotic antimicrobial agents. Delivery systems – formulations, targeted drug delivery, Sustained release of drugs. Drug distribution in body, bio-availability and pharmacokinetic studies.

### **UNIT - III PHARMA PRODUCTS, PROCEDURE, NOVEL VACCINE TECHNOLOGY**

Microbial contamination and spoilage of pharmaceutical products – infection risk and contamination control - and their sterilization. Manufacturing procedures, in-process control of pharmaceuticals. Chemical disinfectants, antiseptics and preservatives- Other pharmaceuticals produced by microbial fermentations. New vaccine technology, DNA, synthetic peptide, multivalent subunit vaccines.

### **UNIT - IV ANTIMICROBIAL BIOASSAY AND ANTIMICROBIAL TESTING:**

Bioassay of antibacterial agents in liquid media and in agar media using CLSI (NCCLS) guidelines - Factors affecting bioassay, Laboratory methods to assess activity of antimicrobial combinations (antagonism, synergism and additive effect). Methodologies for testing of antimycobacterial, antifungal, antiparasitic and antiviral drugs (in vivo and in vitro infectivity models). Application of cell cultures in pharmaceutical industry and research.



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## UNIT - V QUALITY CONTROL AND CLINICAL STUDIES:

Government regulatory practices and policies, Sterilization control and sterility testing- Chemical and biological indicators. Regulatory authorities for introduction of medicines in market – Role of Food and Drug Administration, FDA guidelines for drugs / biologicals, Validation of GMP, GLP & GCP. Clinical studies: Phase I, phase II, phase III and phase IV of clinical trials –Objectives, Conduct of trials, Outcome of trials. 29

## UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

A visit to a pharmaceutical industry / pharmacy institution - assignments submission on various topics of the pharmaceutical microbiology - Quiz classes - short seminar presentations after a visit – debates on GMPs, GLPs and clinical trials – discussion of previous year question papers.

### P22MBCC2B-Pharmaceutical Microbiology-Mapping

1:Slight(Low) 2:Moderate(Medium) 3:Substantial(High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3
CO2	3	2	2	2	3
CO3	2	2	2	3	3
CO4	2	2	3	3	3
CO5	2	3	2	3	3
Optimum Point	2	2	2	3	3

  
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## **CORE PRACTICAL II MICROBIAL PHYSIOLOGY AND METABOLISM & MEDICAL MICROBIOLOGY MICROBIAL PHYSIOLOGY AND METABOLISM**

### **COURSE OBJECTIVES:**

- To provide hands-on practice on microbial physiology and metabolism-based experiments so as to enlighten the learners on the fundamental principles of the course.
- To impart skills required for estimating protein & nucleic acids
- To study the microbial growth influencing factors.
- To understand the colorimetric estimating principles of biological molecules.
- To practice the students on the cultivation methods of anaerobic microbes

### **EXPERIMENTS:**

1. Colorimetric estimation of Protein (Biuret method/Lowry et. al. method)
2. Colorimetric estimation of amino acid (Ninhydrin method)
3. Colorimetric estimation of DNA (Diphenylamine method), RNA (Orcinol method)
4. Carbohydrate fermentation tests: Glucose, Lactose, Sucrose and Mannitol.
5. Biochemical test to identify bacterial isolates - IMViC test, Oxidase test, Catalase test, Urease test, Hydrogen sulphide, coagulase, TSI test, Nitrate reduction test
6. Enzymatic hydrolysis of Starch, Gelatin, Casein & lipid.
7. Bacterial Growth curve: Cell count/viable count/absorbance (total count)
8. Measurement of Microbial growth –Turbidity methods –  
Determination of Generation time, Neubaur Counting chamber.
9. Studying the influence of osmotic pressure, pH, temperature, moisture, radiations, different chemicals, carbon and nitrogen sources.
10. Anaerobic cultivation- candle jar, gas pack method. Wrights tube – McIntosh and Fildes' jar



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## MEDICAL MICROBIOLOGY

### COURSE OBJECTIVES:

- To provide hands- on training as to identify bacteria, fungi, protozoa and helminths from clinical specimens.
- To provide the knowledge of clinical specimens' collection and methods of scrutinization.
- To educate diagnostic and public health microbiology and to expose to the modern techniques employed to identify pathogens in diagnostic laboratories.
- To train on the usage of various instruments.
- To ensure a familiarity with all conventional methods of microbial identification.

### EXPERIMENTS:

1. Collection, coding and transport of clinical specimens for microbiological examinations.
2. Isolation and identification of Streptococcus pyogenes from throat swab.
3. Isolation and identification of Staphylococcus aureus from pus.
4. Isolation and identification of Klebsiella pneumoniae from sputum.
5. Isolation and identification of Salmonella and Shigella from stool.
6. Isolation and identification of E. coli from urine.
7. Antibiotic susceptibility test – Disc diffusion method (Kirby –Bauer).
8. Determination of MIC of any one antibiotic against any one bacterial species.
9. Laboratory diagnosis of dermatophytic diseases- Wood lamp examination and culture and identification of dermatophytes – KOH Mount, LPCB staining and other related tests.
10. Identification of Candida albicans – Microscopy (LPCB stain), culturing, germ tube technique.
11. Identification of Cryptococcus neoformans – Negative staining (India Ink), culturing.
12. Laboratory diagnosis of intestinal protozoan and helminthic infections – Direct examination and concentration of stool – Saline and Iodine wet mount to detect cysts, trophozoites and eggs.
13. Examination of blood for protozoa and helminths (malaria, filaria) by wet mount, thin and thick stained smears (Giemsa, Wrights or Leishman's staining)



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## P22MBCC2P – MICROBIAL PHYSIOLOGY AND METABOLISM & MEDICAL MICROBIOLOGY - MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3
CO2	2	2	3	3	3
CO3	3	3	2	3	3
CO4	3	3	3	2	3
CO5	3	2	3	3	3
Optimum Point	3	3	3	3	3

  
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## ELECTIVE COURSE II

### 1. MARINE MICROBIOLOGY

#### COURSE OBJECTIVES:

- To explain the basic concepts of Marine Microbiology and to differentiate various marine groups of microbes
- To understand microbial diversity of the marine environment.
- To understand various biotechnological applications of marine microbiology, marine extremophiles and Bioremediation.
- To learn about the significance and dynamics of marine environment
- To provide a detailed knowledge about marine microbial products and their importance.

#### UNIT - I MARINE MICROBIAL HABITATS AND DIVERSITY:

Marine environment—properties of seawater, chemical and physical factors of marine environment-Ecology of coastal, shallow and deep-sea microorganism – significance of marine microflora. Diversity of microorganism - Archaea, bacteria, actinobacteria, cyanobacteria, algae, fungi, viruses and protozoa in the mangroves and coral environments - Microbial endosymbionts – epiphytes - coral-microbial association, sponge-microbial association.

#### UNIT - II CULTIVATION OF MARINE MICROBES AND NUTRIENT CYCLING:

Methods of studying marine microorganisms- sample collection- isolation and identification: Cultural, Morphological, physiological, biochemical and Molecular characteristics- Preservation methods of marine microbes. Role of microorganisms in carbon, nitrogen, phosphorous and sulphur cycles in the sea under different environments and mangroves.

#### UNIT - III MARINE EXTREMOPHILES AND BIOREMEDIATION:

Survival at extreme environments – starvation – adaptive mechanisms in thermophilic, alkalophilic, osmophilic and barophilic, psychrophilic microorganisms – hyperthermophiles, halophiles and their importance. Microbial consortia and genetically engineered microbes in bioremediation of polluted marine sites - heavy metals and crude oil. Biofouling and their control. bio- corrosion

#### UNIT - IV SEAFOOD MICROBIOLOGY:

Pathogenic microorganisms, distribution, indicator organisms, prevention and control of water pollution, quality standards, International and National standards. Microbiology of processed finfish and shellfish products. Rapid diagnosis of contamination in seafoods and aquaculture products



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## UNIT - V MARINE MICROBIAL PRODUCTS:

Marine microbial products-Carrageenan, agar-agar, sea weed fertilizers- Astaxanthin, carotene-enzyme-antibiotics-antitumour agents, polysaccharide- biosurfactants and pigments. Preservation methods of sea foods. Quality control and regulations for microbial quality of fishes, shellfish and Marine living resources used for food and drugs.

## UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Give a seminar topic related to oceans and the threats they face in recent days. Field trip visit to aquatic and marine ecosystem – Learn about Internationally important marine related Research stations and centres and works going on their places including Idea. To learn about some international and national rules and norms for marine environment protection.

### P22MBE2A – Marine Microbiology - MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3
CO2	2	2	2	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	2	3	2	3	3
Optimum Point	3	3	3	3	3

  
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## ELECTIVE COURSE II MICROBIAL BIOTECHNOLOGY

### COURSE OBJECTIVES:

- This course summarizes the role of microorganisms and their scope in the diverse processes of microbial biotechnology.
- To transpire a knowledge about production of pharmaceuticals.
- To portray about microbial biopolymers.
- To impart the potential applications of microbial and molecular biotechnology in medicine, agriculture and various other current industrial processes.
- Enable the students to become familiar with potential application of PGPR

### UNIT – I MICROBIAL PRODUCTION OF THERAPEUTIC AGENTS AND VACCINES:

History – Microbial vs molecular biotechnology and Commercialization – concerns and consequences - Pharmaceuticals - interferons and growth hormones, enzymes: DNase I and alginate lyase, Monoclonal antibodies – HIV therapeutic agents. Subunit vaccines: Herpes simplex virus, Foot and mouth disease virus, TB, Peptide vaccines – genetic immunization – vector vaccines.

### UNIT – II MICROBIAL PRODUCTION OF COMMERCIAL PRODUCTS:

Microbial production of restriction endonucleases: PstI, Dye: Indigo, Antibiotics: Synthesis of Novel antibiotics. Biopolymers: Xanthan gum and PHA. Microbial production of alcohol, lactic acid, streptomycin, L- glutamic acid, lipase and riboflavin.

### UNIT – III PRODUCTION OF PGPR, BIOFERTILIZERS AND BIOCONTROL AGENTS:

Plant growth promoting bacteria (PGPR) – genetic engineering of nitrogenase gene cluster, hydrogenase and Nodulation. Mass cultivation of microbial biofertilizers: Cyanobacteria (Spirulina), Azolla and other nitrogen fixers (Rhizobia, Azospirillum, Azotobacter and AMF) Biocontrol of pathogens: Siderophores, antibiotics and enzymes. Release of genetically engineered organisms - Ice nucleation and antifreeze proteins. Microbial herbicides. Microbial insecticides (Pseudomonas and Bacillus thuringiensis): - genetic engineering of Bt strains – Bt cotton – viral insecticides – entomopathogenic fungi.

### UNIT – IV PLANT AND ALGAL BIOTECHNOLOGY AND BIOREMEDIATION:

Ti plasmid derived vector systems - Development of insect, virus and herbicide resistant plants, stress and senescence tolerant plants, modification of flower nutritional content, sweetening by genetic engineering. Plant as bioreactors. Production of food, colourant and fuel from microalgae.



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## UNIT – V ANIMAL BIOTECHNOLOGY AND IPR:

Transgenic animals: methods of creating transgenic mice, cattle and sheep. Human gene therapy – in vivo and ex vivo gene therapy. Molecular diagnostics for genetic diseases. Biosafety and Bioethics. Intellectual Property Rights: Patents - copy right and neighboring rights, patents for invention, Drafting and filing a patent application, exploitation of patented invention. Indian patent laws.

## UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Group discussion, quiz and seminar on recent advances in production PGPR, biofertilizers, recombinant bioinoculant for sustainable agriculture, biofuel.

### P22MBE2B – MICROBIAL BIOTECHNOLOGY - MAPPING

1:Slight (Low) 2:Moderate(Medium) 3:Substantial(High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3
CO2	3	3	2	3	3
CO3	3	2	2	2	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Optimum Point	3	3	3	3	3

  
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## NON-MAJOR ELECTIVE COURSE I MEN AND MICROBES

### COURSE OBJECTIVES:

- To educate the developments in microbiology field and its essential components.
- To understand the environmental microbiology and human values.
- To realise the primary producers of functional and supportive systems.
- To get awareness on the beneficial & harmful attributes of microbes.
- To understand the microbial products' importance and their usage in day-to-day life.

### UNIT - I GENERAL MICROBIOLOGY:

History of microbiology: Discovery Era and Transition Period; Historical development in the field of Microbiology; Golden Age of Microbiology, Era of Molecular Biology and Nobel Laureates in Microbiology. Evolution of microorganism. Classification of microorganism: Major Differential Features among Bacteria, Archaea and Eukarya. Modern Trends in Classification: Genome Comparison; RNA Finger Printing and Sequencing; DNA Sequencing; Microbial Phylogeny and Trees.

### UNIT - II ENVIRONMENTAL MICROBIOLOGY:

Terrestrial environment: Porous media and microbial activities. Microorganisms in soils and air. Aquatic and extreme environments. Microbial transport. Biogeochemical cycles and consequences. Microorganisms with organic and metal pollutants. Bioremediation and waste management.

### UNIT - III AGRICULTURAL MICROBIOLOGY:

Soil-plant-microorganism systems: Rhizosphere environments and populations dynamics. Organic compounds released by plant. Plant-microbe interactions: Biologically nutrient fixation, solubilization and mobilization. Plant-microbial symbiosis. Plant diseases caused by microbial pathogens and biological controlling agents.

### UNIT - IV MEDICAL MICROBIOLOGY:

Microbiology and medicine. Infection and immunity. Microbial pathogens and associated diseases. Parasitic infections and medical entomology. Diagnosis, treatments and control of infections. Hospital infections and management. Emerging and re-emerging disease.

### UNIT - V INDUSTRIAL MICROBIOLOGY:

Traditional practices in microbial products. Industrial fermentation and bioreactors. Microbial products (at least on example): Organic acids, solvents, polysaccharides, enzymes, vitamins, hormones, antibiotics, vaccines, alcoholic beverages, food productions and biofuels. Microbial products quality control and monitoring practices.





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UNIT – VI CURRENT CONTOUR (For Continuous Internal Assessment Only):

Human microbiome projects and Earth microbiome projects. Microbes and immune regulations, gut microbiota and brain functions, metabolic disorders and dietary interventions. Microbiota in gastrointestinal issues.

## P22MBNME1 – Men and Microbes - MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	2	3	3
CO5	3	3	3	3	3
Optimum Point	3	3	3	3	3

  
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## **CORE COURSE V MOLECULAR BIOLOGY AND MICROBIAL GENETICS**

### **COURSE OBJECTIVES:**

- In addition to the most essential fundamentals of the subject, the paper aims to impart the current updated knowledge on molecular genetics of prokaryotes.
- Understand the Genetic replication and repair mechanisms
- Learn about gene transfer mechanisms and their importance in natural evolution
- To provide the required fundamental details on prokaryotic and eukaryotic molecular genetics.
- Explain the processes behind mutations and other genetic changes, identify and distinguish genetic regulatory mechanisms at different levels

### **UNIT – I GENETIC MATERIAL, DNA REPLICATION AND REPAIR:**

Identification of genetic material (Griffith, Avery and Hershey and Chase experiments). Organization of genetic material: Bacteria – Eukaryotes: nucleus and nucleosomes, lamp brush and giant chromosomes. DNA replication - Meselson – Stahl experiment, Molecular mechanisms of DNA Replication – bidirectional and rolling circle replication. Differences between prokaryotic and eukaryotic replication.  $\Phi$  X 174 replication. Plasmids – types, structure and replication. Inhibitors of DNA replication - DNA repair – mechanism of excision repair, SOS repair and mismatch repair.

### **UNIT – II TRANSCRIPTION AND TRANSLATION:**

Process of transcription – initiation, elongation – termination. Synthesis of mRNA in prokaryotes and eukaryotes. RNA splicing. Synthesis of rRNA and tRNA. RNA processing – capping and polyadenylation. Inhibitors of transcription. Genetic code, process of translation – initiation, elongation and termination. Signal sequences and protein transport. Inhibitors of translation.



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## UNIT – III REGULATION OF GENE EXPRESSION:

Organization of Genes in Prokaryotes and Eukaryotes - Introduction - Operon concept, lac, trp, arabinose operons, promoters and repressors. Regulation of gene expression – Transcriptional control – promoters, terminators, attenuators and anti-terminators; Induction and repression; The *lac* operon – catabolite repression; *trp* operon, two component regulatory system. Translational control – ribosome binding, codon usage, antisense RNA; post-transcriptional gene silencing – RNAi.

## UNIT – IV GENE TRANSFER AND GENETIC RECOMBINATION MECHANISMS:

Transformation – competence cells, regulation, general process; Transduction – general and specialized; Conjugation – Discovery, mechanism of F+ v/s F-, Hfr+ v/s F-, F' v/s F-, triparental mating, self-transmissible and mobilizable plasmids, pili. Linkage and genetic maps – genetic mapping of T4 phage. C- value paradox. Hardy Weinberg Equilibrium.

## UNIT V MUTATION AND TRANSPOSABLE ELEMENTS:

Types and molecular basis of mutation– Agents of mutation - Importance of mutations in evolution of species. Discovery of insertion sequences, complex and compound transposons – T10, T5, and retroposon – Nomenclature- Insertion sequences – Mechanism – Transposons of *E. coli*, Bacteriophage and Yeast. Isolation, analysis and detection methods of Mutants. Uses of Mutants. Importance of transposable elements in horizontal transfer of genes and evolution. Mobile genetic Elements – IS elements.

## UNIT VI: CURRENT CONTOURS (For continuous internal assessment only):

Discuss gene-therapy workflow from production to quality control - Quiz related to Covid 19 and its mutations and genetic structure-Round table chat section on Molecular computation strategy for classifying complex gene expression- splice Detector- Nanobot-motifs inside human cells, literature seminar on Genome editing technique in embryo- Open talk on - Biomedical tattoo, Disorder due to Mutation to the F



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## P22MBCC31 - Molecular Biology and Microbial Genetics - MAPPING

1:Slight (Low) 2:Moderate (Medium) 3:Substantial (High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3
CO2	3	2	2	2	3
CO3	3	3	2	2	3
CO4	3	3	2	2	3
CO5	3	3	2	2	2
Optimum Point	3	3	2	2	3

  
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## CORE COURSE VI

### ENVIRONMENT AND AGRICULTURAL MICROBIOLOGY

#### COURSE OBJECTIVES:

- This course aims to communicate the students with basic principles of microbiology and their applications to environment and agriculture.
- To explore the field of environmental microbiology by educating about microbes of soil, water and air.
  - To prepare as to redress pressing environmental challenges by developing a fundamental understanding of the microbial communities and processes in natural and built-in environments.
- To study pathogens of drinking water
- To provide an in-depth exploration of the diverse role of microbes and microbial communities in each sector.

#### UNIT – I AEROMICROBIOLOGY:

Microbiology of air - Composition of air, Number and types of microorganisms in air. Distribution and sources of air borne organisms - Droplet and Droplet nuclei, Aerosol. Airborne diseases in Plants, animals and human beings. Methods for assessment of air borne microbes. Air sanitation - Physical and chemical methods.

#### UNIT – II MICROBIOLOGY OF WATER:

Fresh water and marine Environment - Different kinds of water body, Water pollutants, Physico-chemical properties of water. Aquatic microbiology - Sources of microorganisms in water, Microbial assessment of water. Aquatic biota in lake, ponds, river, estuary, mangrove and sea. Extremophiles –Thermophiles, mesophiles, psychrophiles, Deep Sea, Desert, Acidophilic, Alkalophilic and Halophilic microorganisms. Impact of environmental factors on the aquatic biota.



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## **UNIT – III MANAGEMENT OF LIQUID AND SOLID WASTES:**

Classification of wastes. Waste treatment - Types and characterization of liquid and solid wastes. Treatment of liquid wastes - Primary, secondary (anaerobic and aerobic) - trickling, activated sludge, oxidation pond, oxidation ditch-tertiary and disinfection. Treatment of solid wastes - composting, vermiform composting, silage, pyrolysis and saccharifications. Xenobiotic compounds and their degradation - Crude oil, hydrocarbons, pesticides and heavy metals. Bioremediation of copper and uranium. Biodegradation of natural substances - Cellulose, xylan, hemicellulose, starch, fructose, mannan, pectin and lignin.

## **UNIT – IV MICROBIOLOGY OF SOIL:**

Soil microbiology: Distribution of microorganisms in soil, Factors influencing the soil microflora, Biogeochemical cycles: Carbon, Nitrogen, Phosphorus and Sulfur, Interactions among microorganisms: Mutualism, commensalism, ammensalism, synergism, parasitism, predation and competition. Interaction of microbes with plants: Rhizosphere, phyllosphere, mycorrhizae. Nitrogen fixation: Symbiotic and asymbiotic. Soil reclamation.

## **UNIT – V PLANT PATHOGENS AND ITS CONTROL:**

Introduction to plant pathology - Bacterial, viral and fungal plant pathogens. Morphological, physiological changes with reference to disease establishment in plants. Role of insect Entomopathogenic nematodes, viruses, bacteria, fungi and protozoa in biocontrol and their mode of action. Plant protection-phenolics – phytoalexins and related compounds. Disadvantages of chemical pesticides. Microbial pesticides- types, mechanisms, advantages and limitations. Brief conception of Integrated Pest Management (IPM), Integrated Pest and Disease Management (IDPM).

## **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Assignment shall be given based on the syllabus and seminar shall be given to students related to their assignment topics individually. A project shall be assigned in the topic of leguminous plants submission. Mini project in various recent research topics related to the subject shall also be given.



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## P22MBCC32-Environment and Agricultural Microbiology-MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	2	2	3	3
CO5	3	3	3	3	3
<b>Optimum Point</b>	3	3	3	3	3

  
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## **Core Choice Course III BIOPROCESS TECHNOLOGY**

### **COURSE OBJECTIVES:**

- To educate the current technology employed to utilize the natural resources to produce microbial products.
- To impart with broad theoretical skills of industrial microbiology.
- To bring out the bio-resources, industrially important microorganisms, up and down stream process.
- To explore the functions of the fermentors, primary and secondary metabolites and production of recombinant products.
- To comprehend production of steroids, sterols and non-steroid compounds through microbial transformations.

### **UNIT – I ORIGIN OF BIOPROCESS TECHNOLOGY:**

Introduction to bioprocess technology - Scope, Current processes in environment, agriculture and pharma industry. Biological wastes - Biomass, wastes from domestic, agriculture and industries. Scope and current processes in fermentation methods - The range of fermentation process, Chronological development, Component parts of a fermentation process, Fermentation economics.

### **UNIT – II INDUSTRIALLY IMPORTANT MICROORGANISMS:**

Industrially important microorganisms - Isolation, screening, preservation and handling the microbial strains. Improvement of the strains – Mutation, recombinant DNA techniques and modifying the properties of the strains. Industrial media for industrial fermentation - Formulation and sterilization. Development of inoculum for various upstream process.

### **UNIT – III FERMENTOR DESIGN AND TYPES:**

Structural components and parts of a fermentor - body construction, heat production, gas liquid exchange, mass transfer, heat transfer, oxygen transfer, stirring and mixing. Sterilization of a fermentor vessels and nutrients. Scale up and scale down fermentation process. Control of temperature, pH, form pressure Computer application in fermentation technology. Fermentation types – Submerged, solid state, batch and continuous fermentation.





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## **UNIT – IV DOWNSTREAM PROCESSING:**

Recovery of intracellular and extra cellular products - Biomass separation by centrifugation, filtration, chemical and Electro flocculation. Cell disintegration- physical, chemical and enzymatic methods. Extraction - solvent, two phase, liquid extraction, whole broth, aqueous multiphase extraction. Purification by different methods, Concentration by precipitation, ultrafiltration, reverse osmosis. Drying and crystallization.

## **UNIT – V MICROBIAL PRODUCTS:**

Production of varying products - Organic acids - Amino acids, Antibiotics, Enzymes, Vitamins, Alcoholic beverages - wine and beer, Fermented foods - bread, cheese and soy sauce. Recombinant Products - insulin, interferon and growth hormone, Fermentation products from natural wastes - molasses, starch wastes and cellulosic wastes. Microbial transformations - steroids and sterols. Non-steroid compounds - Antibiotics.

## **UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):**

Field trip to dairy, beverage Industry and food processing research Institutes. Analysis of microbiological quality in industrial products. Fermented food preparation. Mycotoxins detection in food samples. Awareness to the industrialists about the prevention of contamination in fermentation products. Daily news and research paper on bioprocess technology.



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## P22MBCC3A -Bioprocess Technology-MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	1
CO2	3	3	3	3	1
CO3	2	3	2	1	1
CO4	3	2	1	3	1
CO5	2	2	1	3	1
Optimum Point	3	3	2	3	1

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## CORE CHOICE COURSE III

### 2. BIOETHICS AND INTELLECTUAL PROPERTY RIGHTS

#### COURSE OBJECTIVES:

- To educate the ethical practices appropriate to the discipline at all times.
- To gain knowledge about Hippocratic tradition.
- To create awareness on human embryonic development.
- To adopt safe working practices relevant to the bioindustries & field of research.
- To educate the students to acquire knowledge about IPR.

#### UNIT – I BIOETHICS:

Definition - Basic human values such as the rights to life and health - The use of nature, Different views of Nature, Dynamic Nature, Interfering with Nature, Integrity of Species; Reducing Genetic Diversity; Biological Warfare; General Ethical Concerns for recombinant research.

#### UNIT – II HISTORY OF MEDICAL ETHICS:

The Hippocratic tradition: A Profession, Philanthropy, Do no harm. Adoption to the Oath by Western Medicine - Retaining the Hippocratic Oath – modern medical code of ethics – essential features of a good physician.

#### UNIT – III STATUS OF HUMAN EMBRYO:

Human Embryonic Development; Ethics through Embryo Development: Fertilization, The Fetus and feeling pain; Scientific Research on Human Embryos and its Experimental goals - Ethical issues in Embryo Research.

#### UNIT – IV ANIMAL RIGHTS:

Making New Strains of Animal: Ethical limits and regulations of Animal use: Religious views of Animal status. Human Gene Therapy: Ethical issues in Gene Therapy: Efficiency of treatment; Safety of Transferred Genes; Human rights, Ethical guidelines for genetically modified foods.

#### UNIT – V INTELLECTUAL PROPERTY RIGHTS:

Definition, types, tools – Patenting; Trademark; Trade secret; Copyrights; related rights; Geographical Indications; Industrial Designs. TRIPS. National (IPO) and International Agencies (WTO, WIPO) involved in IPR and Patenting. NABL accreditation.

#### UNIT – VI CURRENT CONTOURS (for continuous internal assessment only):

Current amendments in ethical issues regarding human embryo research, human gene therapy, copy right, patents may discuss in groups, conducting quiz and seminar to make the students to become familiar in biosafety and bioethics.



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## P22MBCC3B - Bioethics and Intellectual Property Rights -MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2
CO2	2	2	2	2	2
CO3	3	2	1	2	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Optimum Point	3	3	3	3	3

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## CORE PRACTICAL III

### MICROBIAL GENETICS AND MOLECULAR BIOLOGY & ENVIRONMENT AND AGRICULTURAL MICROBIOLOGY

#### MICROBIAL GENETICS AND MOLECULAR BIOLOGY

##### COURSE OBJECTIVES:

- To impart advance knowledge to the students related to the field of Microbial genetics.
- To educate about isolation of Nucleic acids
- To get a knowledge on checking the quantity and quality of the nucleic acids.
- To carry out the Blotting techniques.
- To identify the types of staining and their application in detection of microorganisms.

##### EXPERIMENTS:

1. Isolation of Microbial DNA
2. Isolation of Microbial RNA
3. Isolation of antibiotic resistant microbes
4. Quantification of DNA/Plasmid by Spectrophotometric method
5. Characterization of DNA / plasmid DNA by agarose gel electrophoresis.
6. Isolation of plasmids from E. coli (mini preparation).
7. Competent cell preparation and Bacterial transformation
8. Polymerase Chain Reaction
9. Blotting techniques (Southern, Northern, Western and Dot blotting's)
10. Generalized transduction in E. coli.
11. Characterization of plasmid DNA by agarose gel electrophoresis.
12. Restriction digestion and Ligation of DNA
13. Isolation of mutants by spontaneous mutation – Gradient plate technique
14. Isolation of auxotrophic and antibiotic resistant mutants by physical and chemical mutagens

##### COURSE OUTCOMES:

After the completion of the course, students will be able to:

- Handle the clinical samples and process them for molecular techniques
- Get a clear practical knowledge on instruments used in molecular biology lab.
- Study about the Antibiotic resistance among microbes
- Understand the Transformation mechanisms.
- Learn the quantification of macromolecules in industrial point of view.

#### ENVIRONMENTAL AND AGRICULTURAL MICROBIOLOGY

##### COURSE OBJECTIVES:

- To prepare the students for sensible knowledge in a wide range of profession.
- To provide the scientific discipline that deals with the application of microorganisms and the knowledge about them.
- To explain the applications of the course in microbial biotechnology, agriculture, food microbiology and bioremediation.



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- To impart significant experiments linked with environment and agriculture.
- To train on the assessment of microbial quality of air, water and soil.

## EXPERIMENTS:

1. Enumeration of Microorganisms from air by open plat technique
2. Enumeration of Microbial population from rhizosphere and non-rhizosphere soil
3. Isolation and enumeration of soil microorganisms (bacteria, fungi and actinomycetes).
4. Localization of Arbuscular Mycorrhizae (AM)
5. Isolation of Azospirillum and Azotobacter from soil
6. Isolation of Rhizobium sp. from root nodules of legumes
7. Evaluation of root nodule by cross section of legume roots.
8. Isolation of phosphate solubilizing bacteria from soil
9. Isolation of Cyanobacteria from agricultural soil and water
10. Isolation of bacterial and fungal pathogens from plants
11. Isolation and identification of air-borne microbes using Andersen sampler.
12. Determination of BOD and COD of polluted and pond water.
13. Assessment of water quality by MPN technique
14. Screening of antagonistic bacteria in soil by agar block overlay method.
15. Demonstration of the plant diseases: a) Tobacco mosaic; b) Bacterial blight of paddy; c) Downy mildew of bajra; d) Powdery mildew of cucurbits; e) Head smut of sorghum; f) Red rot of sugar cane; g) Citrus cancer; h) Downy mildew of bajra; i) Powdery mildew of cucurbits.

### P22MBCC3P - Microbial Genetics and Molecular Biology & Environment and Agricultural Microbiology (Practical)-Mapping

1:Slight (Low) 2:Moderate(Medium) 3:Substantial(High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	3
CO2	3	3	2	3	3
CO3	2	3	3	2	3
CO4	2	3	3	3	2
CO5	3	3	2	3	3
<b>Optimum Point</b>	3	3	3	3	3

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## **ELECTIVE COURSE III GENETIC ENGINEERING**

### **COURSE OBJECTIVES:**

- To educate the learners with the growing significance of genetic and protein engineering
- To impart the genetic molecules' cloning techniques.
- To provide the students with the advanced tools, techniques and methods employed in DNA studies
- To know the gene cloning & expression as well as protein engineering strategies.
- To study the genome mapping and human genome profile status.

### **UNIT – I INTRODUCTION TO DNA CLONING:**

DNA cloning: Basic steps and methods of DNA cloning - Isolation and purification of nucleic acids (genomic DNA, RNA and Plasmids) – Methods of handling and quantification of DNA and RNA. Analyses of DNA/ RNA and proteins: Agarose gel, polyacrylamide and pulsed field gel electrophoresis of DNA - Blotting – Southern, Northern and Western Blottings. Labeling of probes. Chromosome walking. Native PAGE, and two-dimensional PAGE analysis of proteins.

### **UNIT – II TOOLS OF GENE CLONING & SCREENING OF CLONES:**

Enzymes for gene manipulation - DNA polymerases, nucleases, DNA ligases, methylases – Cutting, joining and introduction of DNA into living cell: adapters, linkers and homopolymer tailing. Gene transfer techniques: electroporation, microinjection, protoplast fusion and microparticle bombardment. Screening for recombinants: Direct: Insertional inactivation, plaque phenotype and indirect methods: Immunochemical detection, nucleic acid hybridization, Dot and Colony Blotting. Construction and applications of Genomic DNA and cDNA libraries.

### **UNIT – III CLONING AND EXPRESSION VECTORS:**

Vectors: types, properties - plasmids vectors for cloning in E. coli (pBR322 and derivatives, pUC vectors and pGEM3Z) - plasmids– host range and incompatibility. Vectors constructed based on bacteriophages (M13 and Lambda), cosmids, phasmids, phagemids and BACs. Eukaryotic vectors - 2 $\mu$ m plasmid, YACs, and P elements – animal (retroviruses) and plant vectors (Ti plasmid based vectors) – over expression vectors: E. coli lac and T7 phage, and Tet-regulatable promoters based vectors - shuttle vectors – Brief account on over expression systems: Saccharomyces cerevisiae, Pichia pastoris, Schizosaccharomyces pombe and Kluyveromyces lactis. Baculovirus & Mammalian cell over expression systems.

### **UNIT – IV GENOME MAPPING AND HGP:**

Genomic mapping: genetic and physical - Restriction mapping, RFLP, FISH, Sequence tagged site. Polymerase chain reaction (PCR) – Principles, types and their applications. Sequencing genomes – primer walking, chain termination, chemical degradation, Pyrosequencing – DNA chips and micro array. Sequence assembly – shot gun, clone contig methods.



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## UNIT – V PROTEIN ENGINEERING AND PROTEOME ANALYSIS:

Site directed mutagenesis: conventional and PCR-based methods - Design and construction of novel proteins and enzymes, Basic concepts in enzyme engineering, engineering for kinetic properties of enzymes, protein folding, protein sequencing, protein crystallization. Data analysis - Mass spectrometry based Proteome analysis, MALDI-TOF and LC-MS platforms – Applications of protein engineering: Examples of engineered proteins. Protein 51 arrays and their applications.

UNIT – VI CURRENT COUNTERS (For continuous internal assessment only): Any one demonstration related to genetic engineering/gene cloning using charts or prepared models or teaching kits – Assignments - Quiz classes - short seminar presentations – debates on genetic engineering and human ethics.

### P22MBE3A – Genetic Engineering - MAPPING

1:Slight (Low)2:Moderate (Medium) 3:Substantial(High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	1
CO2	2	3	2	3	1
CO3	2	3	2	3	1
CO4	3	3	2	3	1
CO5	2	3	2	3	1
<b>Optimum Point</b>	3	3	2	3	1

  
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## ELECTIVE COURSE III

### 2. MICROBIAL NANOTECHNOLOGY

#### COURSE OBJECTIVES:

- To educate the role of microbes and other eukaryotic systems in the synthesis of nanoparticles.
- To provide the knowledge of advanced methods of synthesis and designing of nano particles.
- To impart them the potential applications of nanoparticles/materials in a variety of areas.
- To analyze the nanoparticles using various instrumentation methods.
- To understand the merits and demerits of nanoparticles.

#### UNIT – I INTRODUCTION TO BIONANOTECHNOLOGY:

Milestones in History – Bionanotechnology – concept and future prospects – application in Life Sciences. Terminologies – nanotechnology, bionanotechnology, nanobiomaterials, biocompatibility, nanomedicine, nanowires, quantum Dots, nanocomposite, nanoparticles, nanosensors. Biotechnology to bionanotechnology, natural bionanomachines. Current status of bionanotechnology.

#### UNIT – II SYNTHESIS OF NANOPARTICLES:

Molecular nanotechnology – nanomachines – collagen. Uses of nanoparticles – cancer therapy – manipulation of cell and biomolecules. Cytoskeleton and cell organelles. Types of nanoparticles production – physical, chemical and biological. Microbial synthesis (bacteria, fungi and yeast) of nanoparticles – mechanism of synthesis.

#### UNIT – III TYPES OF NANOPARTICLES AND METHODS OF CHARACTERIZATION:

Nanoparticles – types, functions – Silver, Gold and Titanium. Physical and chemical properties of nanoparticles. Characterization of nanoparticles – UV-Vis spectroscopy, particle size analyzer, Electron Microscopy – HRTEM, SEM, AFM, EDS, XRD. Other tools and techniques required for bionanotechnology: rDNA technology, site directed mutagenesis, fusion proteins, X- Ray crystallography, NMR. Bioinformatics: molecular modeling, docking, computer assisted molecular design.

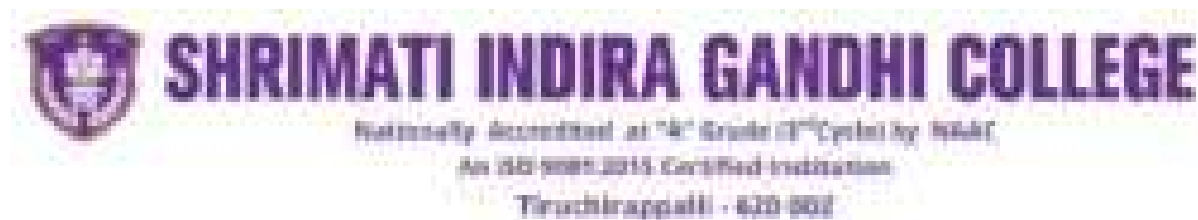
#### UNIT – IV APPLICATIONS OF BIONANOTECHNOLOGY:

Drug and gene delivery – protein mediated and nanoparticle mediated. Uses of nanoparticles in MRI, DNA and Protein Microarrays. Nanotechnology in health sectors. Nanomedicines, Antibacterial activities of nanoparticles. Nanotechnology in agriculture. Toxicology in nanoparticles – Dosimetry.

#### UNIT – V MERITS AND DEMERITS OF NANOPARTICLES:

Advantages of nanoparticles – drug targeting, protein detection, MRI, development of green

chemistry – commercial viability of nanoparticles. Disadvantages – pollution and health risks associated with nanoparticles.



UNIT – VI CURRENT COUNTERS (For continuous internal assessment only):

Methods of green biosynthesis of silver, gold and zinc nanoparticles from medicinal plant extracts. Sequential characterization of nanoparticles. Assay of nanoparticles for their bioefficiency.

**P22MBE3B – Microbial Nanotechnology - MAPPING**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	2
CO2	3	2	2	2	2
CO3	2	2	2	2	3
CO4	2	2	2	3	2
CO5	2	2	2	2	2
Optimum Point	2	2	2	2	2

  
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## NON MAJOR ELECTIVE II PUBLIC HEALTH MICROBIOLOGY

### COURSE OBJECTIVES:

- To acquaint the student with basic concept of public health and prophylactic measures.
- To understand air borne infection and its control measures.
- To acquire basic knowledge on gastro- intestinal infections associated with food and water.
- To assess the nature of sexually transmitted diseases of human beings.
- To understand vector borne diseases of human beings.

### UNIT – I IMPORTANCE OF PUBLIC HEALTH:

Definition, scope, concept and importance of public health microbiology, Roles of microbiologist in public health, Concept of health and disease, Indicators of health. National health programs and public health hazard in the community. Vaccine - types- live, killed, toxoid, recombinant, edible vaccine. Indian vaccination schedules.

### UNIT – II AIR BORNE DISEASES:

Composition of Air -Transmission of air borne infections – Causative agent characters, symptoms, control and treatment of air borne infections – Bacterial pneumonia, Diphtheria, Tuberculosis, Influenza, Measles, Covid-19. Method of measuring microorganisms in air. Air Sanitation.

### UNIT – III WATER AND FOOD BORNE DISEASES:

Types of food borne diseases, Food poisoning and food intoxication. Food borne infection, Water pollution and sanitation, Nature of causative agent, Transmission, control and treatment of diseases from food and water: gastroenteritis, Cholera, Typhoid, bacillary dysentery, amoebic dysentery (Amoebiasis, Giardiasis) and Poliomyelitis. Awareness of Peptic ulcer and its consequences. Food spoilage and spoilage of food by microorganisms.

### UNIT – IV SEXUALLY TRANSMITTED DISEASES:

Characters of causal organisms and control of the following diseases - Syphilis, HIV/AIDS, Hepatitis B and C, Gonorrhoea, Genital herpes, Chlamydia, Trichomoniasis. Control of sexually transmitted infections. Technique used for the diagnosis of sexually transmitted infection.

### UNIT – V VECTOR BORNE HOSPITAL BORNE AND ZOO NOTIC INFECTIONS:

Vector and its types- Vector borne diseases, Transmission, character, and control of the following vector borne diseases - Kala-azar, Malaria, Japanese Encephalitis, Dengue, Chikungunya and Plague. Techniques used in the diagnosis of vector borne infections. Hospital-Acquired Infection and Zoonotic diseases.

### UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):

Methods of preventing common diseases of human. Methods of detecting epidemic infection in a community. Making vaccination schedules for rural community. Public awareness about vaccination and celebration of Vaccination day. Public awareness on the usage of antibiotics.



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## P22MBNME2 – Public Health Microbiology - MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	1
CO2	2	3	2	3	2
CO3	2	3	2	3	1
CO4	3	3	2	3	1
CO5	2	3	2	3	1
Optimum Point	3	3	2	3	1

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## CORE COURSE VII ADVANCES IN VIROLOGY

### COURSE OBJECTIVE:

- To facilitate an understanding on the basics of viruses, virus discovery, viral structure, classification of viruses.
- To provide a general account of bacteriophages, plant, animal and human viral diseases.
- To gain a knowledge on instrumentation relevant to virology.
- To teach the strategies by which viruses spread within a host, and are maintained within populations. To describe the molecular biology of viral reproduction and addresses the interplay between viruses and their host organisms.
- To expose to molecular diagnostics and emerging infectious diseases of human and animals.

### UNIT – I GENERAL VIROLOGY:

Virus – Virion - Discovery of Viruses – General properties of Viruses – Classification of Viruses (LHT, Baltimore and ICTV) - Ultra structure of Viruses – Sub viral agents- viroids, prions, virusoids and satellite viruses – Replication of Viruses - Virus attachment, Initiation of infection, cellular receptor for viruses, entry of viruses, genome replication, assembly, Packaging signals, packaging of segmented genome, acquisition of an envelope, budding strategies.

### UNIT – II MICROBIAL VIRUSES:

Bacteriophages – Classification - Structure and life cycle - T4 Phage, Lambda Phage, Mu Phage, M13 Phage, P1 Phage – lytic and lysogenic Life cycles - Bacteriophage typing, Phage therapy (bacteriophage therapy), Cyanophages, Mycoviruses (Mycophages), Rhizobiophages – Cultivation strategies of phages from sewage and other ecosystem – Importance of phages in pollution control.

### UNIT – III ANIMAL AND HUMAN VIRUSES:

Classification - Structure, Multiplication, Pathogenesis, Diagnosis, Prevention and Treatment of following animal viruses – Papovaviridae (Human Papilloma Virus), Adenoviridae, Herpesviridae (Chicken Pox), Poxviridae (Monkey Pox), Hepadnaviridae (HBV), Picornaviridae (Polio Virus), Rhabdoviridae (Rabies), Orthomyxoviridae (Swine Flu), Reoviridae (Rota Virus), Retroviridae (HIV) and Flaviviridae (Chikungunya virus) - Cultivation of human viruses- Embryonated eggs and Cell culture system - Serological and immunological methods of diagnosis.



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## UNIT – IV PLANT VIRUSES:

Classification– Transmission of plant viruses – Symptoms of Viral infection in plants - Control of plant viral diseases - Cultivation of Plant viruses – Meristem culture – TMV - CaMV-

Common viral diseases in paddy, cotton, tomato and sugar cane - Name of diseases, pathogens and symptoms. Generation of virus-free planting material; vector control.

## UNIT – V EMERGING VIRUSES, ONCOGENIC VIRUS AND CONTROL OF VIRUSES:

Control of Viruses - requirement of an effective vaccine, different ways of making vaccine, types of Vaccine. Anti-viral drugs - Theories on origin of virus, evolution of new viruses, emerging viruses, Factors that drive viral emergence - viral cancer, transformation and oncogenesis-Virus-induced cancer, Avian leucosis retroviruses, Proviral DNA sequences, Proto-oncogenes, DNA tumor Viruses, the link between DNA virus biology and transformation.

## UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):

Case study of health risk associated with a virus epidemic, the origin of outbreak, the spread, the intervention strategies, public health response.

### P22MBCC41 – ADVANCES IN VIROLOGY - MAPPING

1:Slight (Low) 2:Moderate(Medium) 3:Substantial(High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	3
CO2	3	3	2	3	3
CO3	2	3	3	2	3
CO4	2	3	3	3	2
CO5	3	3	2	3	3
<b>Optimum Point</b>	3	3	3	3	3

  
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## CORE COURSE VIII

### IMMUNOLOGY AND IMMUNOTECHNOLOGY

#### COURSE OBJECTIVES:

- To understand the various components of the host immune system.
- To study the structural organization and functions of immune cells and organs.
- To learn the antigens, antibodies and antigen antibody reactions.
- To understand the structural nature of T cells, B cells and immunity.
- To describe the concepts of immune-technology.

#### UNIT – I IMMUNE SYSTEM:

History of Immunology, Immunity - innate and acquired. Inflammation. Haematopoiesis – Blood Group System, Cells of the immune system- lymphocytes, macrophages, mononuclear phagocytes- dendritic cells, granulocytes, NK cells and mast cells Central and peripheral lymphoid organs- Thymus, bone marrow, spleen, lymphnode, MALT and GALT.

#### UNIT – II T AND B CELL:

Detailed structure and development of B cell and T cell – receptors - Structure of CD4, CD8, MHC-I, MHC-II molecules, cellular adhesion molecules (ICAM, VCAM, selectins, integrins). Activation of T and B cells- Maturation of T cell and B cell. Organization of the genes for B and T cell receptors. Genetic organization of MHC-I and MHC-II complex (both HLA and H-2). Peptide loading and expression of MHC-I and MHC-II molecules

#### UNIT – III ANTIGEN, ANTIBODY AND AG-AB REACTIONS:

Antigen – Types, Toxoid-vaccines -antigen recognition, processing and presentation - Cell mediated immunity – Humoral mediated immunity – antibody – types. Theories of antibody formation. Rearrangement of genes in antibody formation – Molecular mechanisms responsible for generating diversity of antibodies and T cell receptors. Interaction of T and B cells. Antigen – antibody reactions - Precipitation, agglutination, complement fixation, RIA, ELISA, Western blotting and immunofluorescence.

#### UNIT – IV IMMUNE MECHANISMS:

Complement system: Basics of complement protein - different pathways of complement activation - classical and alternative. Hypersensitivity reaction and their types. Auto immune disorders, transplantation and cancer immunology. Deficiencies / defects of T cells, B cells, and phagocytic cells. Immunity to tuberculosis, malaria and HIV.

#### UNIT – V IMMUNOTECHNOLOGY AND ITS APPLICATIONS:

Production of polyclonal, monoclonal antibodies and phage display - techniques and applications. Immunization practices- active and passive immunization. Vaccines killed and attenuated, recombinant vaccines, DNA and peptide vaccines. Applications of immunotechniques – Flow cytometry, Immunoelectron microscopy, Immunohistochemistry and Bioplex array.



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## UNIT – VI CURRENT CONTOURS (For continuous internal assessment only):

Review and debate on latest discovery on immunology; Seminar on immune responses against SARS-CoV2 and vaccination for COVID-19. Quiz: Autoimmune diseases, Tumor immunology, immunological biosensors. Review on prospects and future of immunosensors.

### P22MBCC42 – Immunology and Immunotechnology - MAPPING

1:Slight (Low) 2:Moderate(Medium) 3:Substantial(High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	3	2
CO2	2	2	2	3	2
CO3	2	2	2	2	2
CO4	3	3	3	3	3
CO5	2	3	2	2	2
Optimum Point	2	2	2	2	2

  
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## **VALUE ADDED COURSE II QUALITY CONTROL IN INDUSTRIES**

### **COURSE OBJECTIVES:**

- To acquire the knowledge of quality control in pharmaceutical industry.
- To learn the quality control audits in industries.
- To understand the basics of food safety and food quality.
- To realize the microbial quality control in hospitals.
- To acquire knowledge on environment monitoring and regulations.

### **UNIT – I QUALITY CONTROL IN PHARMACEUTICAL INDUSTRY:**

Basic of pharmaceutical products and their quality control: bulk drugs, forms, vaccines – both chemical and microbiological parameters. Environmental Monitoring – Pharmaceutical industry, Manufacture of Sterile Medicinal Products- British, European, USA-US and Indian pharmacopoeias.

### **UNIT – II INDUSTRIAL QUALITY CONTROL AND QUALITY AUDITS:**

Process quality control- sterile and nonsterile preparations, Quality control – raw materials, purity check, quality check of finished products, Industrial responsibilities – social and environmental safety.

### **UNIT – III FOOD SAFETY AND FOOD QUALITY:**

Microbiological criteria of food, food products, beverages. Monitoring of factory hygiene and sanitation, Microbiological quality of ingredients, processing and finished products. Food Safety and Standards Authority of India (FSSAI). Food contaminants and diseases.

### **UNIT – IV MICROBIAL QUALITY CONTROL IN HOSPITALS:**

Control of Healthcare associated infections (HAI) - Culture Identification, Sensitivity pattern, report preparations, HAI surveillance, resistance surveillance, Monitoring water quality in hospital, healthcare infrastructures. Corrective action system, Environmental monitoring and clean room commission



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## UNIT – V MICROBES AND THEIR APPLICATIONS:

Quality control in biodegradation and bioremediation. Microbes used in the biofertilizers and bio-pesticides and bio-fuels.

## UNIT - VI CURRENT CONTOURS (For continuous internal assessment only):

Assignment shall be given based on the syllabus and seminar shall be assigned to students related to their assignment topics individually. A project shall be assigned in the topic of prevalence of microorganisms in industrial products. Mini project in various recent research topics related to subject can be given.

### P22MBVAC2 - Quality Control in Industries - MAPPING

1:Slight(Low) 2:Moderate(Medium) 3:Substantial(High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	1	2	1	1
CO2	1	2	2	1	1
CO3	1	2	1	2	2
CO4	1	1	1	1	1
CO5	2	2	2	2	2
<b>Optimum Point</b>	2	2	2	2	2

  
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## PG & RESEARCH DEPARTMENT OF MICROBIOLOGY

### PROGRAMME OUTCOMES

- Graduates would acquire both theoretical and practical knowledge of fundamental concepts in Microbiology.
- Graduates would knowledgeably be competent with characteristics, skills and cognizance established.
- A microbiologist could enter into higher studies for their passion of futuristic drive or could prefer academia for manifesting instructional capability.
- After graduation, the graduates can join public health sectors not only for career advancement but, for the betterment/welfare of the human society as well.
- Understand and appreciate the importance of microbes in different arena of novelty for day-to-day applications.

### CORE COURSE I

#### BASICS OF MICROBIOLOGY

##### COURSE OBJECTIVES:

- To understand classification of microorganisms and basic concepts of Microscopes.
- To understand bacterial size, shape and their structure.
- To understand the general characteristics of prokaryotic and eukaryotic microorganisms.
- To understand the concept of microbial control.
- To understand the process of microbial growth and nature of culture media.

##### UNIT – I History, Taxonomy and Microscopy:

Introduction-Definition, scope of Microbiology, Concepts of Microbiology, Major contribution of microbiologists. Classification - Taxonomy, Taxonomic ranks - Three kingdom concept, five kingdom concept, and three domain concepts. Microscopy: Principles and applications of microscopes: brightfield, dark field, phase contrast, fluorescent, SEM and TEM. Micrometry – measurement of bacterial size.

##### UNIT – II Classification and Ultrastructure:

Difference between prokaryotic and eukaryotic microorganisms. Outline classification of bacteria on the basis of Bergey's manual of systemic bacteriology. Structural organization of bacteria – Size, shape and arrangement of bacterial cells - Ultrastructure of a bacterial cell - cell wall, cell membrane, ribosomes, nucleoid, slime, capsule, flagella, fimbriae, spores, cysts, plasmid, mesosomes and cytoplasmic inclusions.

##### UNIT – III General Characters, Eucaryotic Classification and Staining:

General characteristics and nature of Archaeobacteria, Cyanobacteria, Mycoplasma, Rickettsiae, Chlamydia, Spirochaetes, Actinobacteria, Protozoa, Algae, Fungi, lichens and Viruses. Basic understanding of classification of algae Fritch, fungi-Alexopoulos and protozoa. Principles and types of staining– Simple, gram, acid fast, spore and Capsule staining.



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## UNIT – IV Control of Microorganisms:

Physical methods of Sterilization - Moist heat, dry heat and filtration and radiation – Chemical methods of sterilization – phenolics, alcohols, heavy metals, aldehydes and gaseous chemicals. Antimicrobial chemotherapy – Mode of action of antibiotics. Factors affecting the growth of microorganisms.

## UNIT – V Microbial Growth:

Culture media – Types of Medium, simple, enriched, enrichment, selective, differential and transport medium. Classification medium. Common ingredients of culture media – peptone Sodium chloride, yeast extract beef extract and agar. Pure culture techniques – Serial dilution, pour plate, spread plate and streak plate technique. Aerobic and Anaerobic culture techniques. Preservation of microorganisms.

## Unit – VI Current Contours (For continuous internal assessment only):

Comment on recent trends in microbiology. How microbes relate to biotechnological innovations. Impart knowledge in ubiquitous nature of microorganisms. Identification features in relation to morphology and culture.

### 22SCCMB1 - Basics of Microbiology- MAPPING

1:Slight(Low)2:Moderate(Medium)3:Substantial(High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	2
CO3	3	2	3	3	3
CO4	2	2	3	2	2
CO5	3	3	3	2	3
Optimum Point	3	3	3	3	3

  
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## CORE PRACTICAL I

### BASICS OF MICROBIOLOGY

#### COURSE OBJECTIVES:

- To operation of all laboratory equipments.
- To isolation techniques of microorganisms
- To staining of microbial cells
- To enumeration methods of microorganisms
- To understand basic structure of microbes.

#### EXPERIMENTS:

1. Laboratory rules and regulations.
2. Basic requirements of Microbiology laboratory.
3. Principles and operations – Autoclave, Hot Air Oven, Incubators, Laminar Air Flow, Filtration, colony counter, Centrifuge, pH meter, Colorimeter and Spectrophotometer
4. Cleaning and sterilization of glassware.
5. Preparation of culture media – solid, semi-solid and liquid.
6. Illustrate contributions of Antony Von Leuwenhoek Louis Pasteur, Sergi Winogradsky, Alexander Fleming, Robert Koch, Joseph Lister and Edward Jenner.
7. Measurement of size of microbes – micrometry.
8. Isolation of bacteria, actinobacteria, fungi and cyanobacteria from soil sample.
9. Pure culture techniques - Streak plate, Pour plate and Spread plate.
10. Test for motility of bacteria – Hanging drop method
11. Staining techniques – Simple staining, Gram's staining, Spore-staining, Capsular staining and LPCB.
12. Observation of permanent slides to study the structural characteristics of algae (Anabena, Nostoc, Spirulina, Oscillatoria), fungi (Rhizopus, Saccharomyces, Penicillium, Aspergillus, Agaricus) and protozoa (Entamoeba histolytica, Giardia lamblia and Plasmodium sp.).
13. Components and uses of Peptone, sodium chloride, Yeast extract, agar- agar, Nutrient agar, EMB agar, Mac Conkey agar, Mueller Hinton Agar and Potato Dextrose agar.



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## 22SCCMB1P – Basics of Microbiology -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	2
CO2	3	3	3	3	3
CO3	3	2	3	3	3
CO4	3	3	2	2	3
CO5	3	3	3	3	3
Optimum Point	3	3	3	3	3

  
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## FIRST ALLIED COURSE I

### FUNDAMENTALS OF BIOLOGICAL SCIENCES

#### COURSE OBJECTIVES

- To gain the basic knowledge about plants and animals.
- To study the biological concepts of plant and animal evolution and establishments.
- To understand the biological sciences' importance to human society.
- To enhance the student knowledge from current biological diversity to safe earth.
- To introduce the recent research topics as to stimulate the learners' interest towards higher studies.

#### UNIT – I Origin, Evolution, Diversity of Biological Sciences:

Origin of life theory, history and evolution of biology. Chemical basis of life and diversity of life forms. General characteristic features of living organisms: Plants, animals and microorganisms. Hierarchical levels of organization in living organisms; difference between prokaryotes and eukaryotes.

#### UNIT – II Plant Diversity and Taxonomy:

Introduction, plant nomenclature - Binomial system, International Code of Botanical Nomenclature (ICBN). Types of classification and plant taxonomy. Salient features and distribution of lichens, bryophytes, pteridophytes, gymnosperms and angiosperms.

#### UNIT – III Plant Functional Traits and Values:

Physiology and reproduction of plants: photosynthesis; anatomy and embryological features; pollination biology; micropropagations. Economic importance of plants and value-added products.

#### UNIT – IV Animal Diversity and Taxonomy:

Introduction to animal kingdom and evolutionary theories. International code of zoological nomenclature (ICZN). Types of classification and nomenclatures of animals. Salient features and distribution of invertebrates and vertebrates.

#### UNIT – V Animal Functional Traits and Values:

Introduction to animal physiology. Growth and homeostasis. Animal behaviour. Brief on comparative anatomy and physiology. Animal reproductive biology and endocrinology. Biological importance on presence of diverse animals.





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## 22SACMB1 - Fundamentals of Biological Science - Mapping

1= Slight (Low) 2= Moderate (Medium) 3 = Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	-	2	3	-
<b>CO2</b>	-	-	1	2	-
<b>CO3</b>	3	2	2	3	3
<b>CO4</b>	2	2	2	3	2
<b>CO5</b>	-	-	-	-	-
<b>Optimum Point</b>	3	2	2	3	3

  
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## FIRST ALLIED PRACTICAL

### FUNDAMENTALS OF BIOLOGICAL SCIENCES & GENERAL BIOCHEMISTRY

#### COURSE OBJECTIVES:

- To understand the plants' tissue anatomical structure.
- To learn the comparative characteristic features of vegetative natures.
- To study the morphological differences among microbes using microscopes.
- To isolate the endophytic microorganisms from medicinal plants.
- To study the microbes based on various staining techniques.

#### EXPERIMENTS:

1. Stem, leaf and root sections of a monocot and a dicot plant
2. Study through permanent slides and specimens (vegetative and reproductive structures) of Coleachate, Vaucheria, Polysiphonia, Fucus (fucus permanent slides only); Rhizopus, Penicillium and Agaricus; Riccia, Anthoceros, Funaria; Cycas, Pinus,
3. Study of the characteristic features of any two flowers for each family: a. Malvaceae/Fabaceae/Cruciferae (any one family), (b) Compositae, c. Euphorbiaceae, (d) Poaceae/Liliaceae (any one family)
4. Extraction of compound from medicinal plant.
5. Determination of ABO Blood group
6. Enumeration of red blood cells and white blood cells using haemocytometer
7. Estimation of haemoglobin using Sahli's haemoglobinometer
8. Preparation of haemin and haemochromogen crystals
9. Safety measures in laboratories, use and calibration of pipettes.
10. Preparation of normal, molar and percent solutions.
11. Concept of pH and preparation of buffers.
12. Assay of enzyme activity of Alkanine Phosphatases, SGOT, SGPT.
13. Estimation of polysaccharide (starch or glycogen) from the biological material.
14. Separation of amino acids by paper chromatography and identification of amino acid.
15. Separation of proteins by PAGE, SDS – PAGE – Demonstration.
16. Pigments (Chlorophyll-Carotenoids-Phycobili Proteins)–Spectrophotometry.



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## 22SACMB1P - Fundamentals of Biological Sciences & General Biochemistry - Mapping

1= Slight (Low) 2= Moderate (Medium) 3 = Substantial (High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	-	3	3	-
CO2	3	2	3	2	1
CO3	3	2	3	3	2
CO4	3	2	2	2	-
CO5	1	-	2	2	-
<b>Optimum Point</b>	3	2	3	3	2

  
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## CORE COURSE II MICROBIAL PHYSIOLOGY

### COURSE OBJECTIVES:

- To impart among the learners the fundamental principles of microbial physiology.
- To provide the role / functions of various organelles of a cell.
- To understand the route of a cell to metabolize carbohydrate, protein and fatty acids.
- To highlight the microbial enzymes' profiles and their activity.
- To underscore the significance of each chemical component of a microbiological medium towards the growth of the organism through theory classes & self-demonstrations.

**UNIT – I** Microbial Growth and Growth Curve: Microbial nutrition and growth: Nutritional requirements of microbes - Autotrophs, Heterotrophs, Photoautotrophs, Chemoautotrophs, Copiotrophs, Oligotrophs, Factors influencing microbial growth – pH, temperature, substrate and osmotic condition. Bacterial growth curve & importance of the growth phases – Generation time - Growth measurements – batch, continuous and synchronous. Diauxic growth.

**UNIT – II** Microbial Enzymes: Bacterial enzymes – classification & nomenclature, properties, kinetics of enzyme action – Michaelis-Menton equation for simple enzymes - coenzymes and cofactors, isozymes. Factors affecting enzyme activity.

**UNIT – III** Carbohydrates: Anabolism & Catabolism: Carbohydrate metabolism: Anabolism – bacterial photosynthesis – oxygenic – anoxygenic, synthesis of carbohydrate – catabolism of glucose – EMP – HMP – ED pathways, TCA cycle – electron transport system, Phosphorylation, oxidative and substrate level phosphorylations.

**UNIT – IV** Proteins: Anabolism & Catabolism: Protein metabolism – synthesis and degradation of amino acids – glycine tyrosine, cysteine, serine, glutamine, synthesis of peptides and proteins – urea cycle

**UNIT – V** Fatty Acids Metabolism: Lipids metabolism – biosynthesis of fatty acids and cholesterol – oxidation of fatty acids. Anaerobic Respiration – Nitrate, sulphate and methane respiration – Fermentations – alcoholic, propionic, mixed acid, lactic acid fermentation.



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**UNIT – VI** Current Contours (For continuous internal assessment only): Demonstration on the role of nutrients & individual components of nutrient agar, nutrient broth, Mac Conkey Agar, Salmonella–Shigella Agar, Mueller-Hinton Agar, Hektoen Enteric Agar, Mannitol Salt Agar, Robertson Cooked Meat Broth – assignments on types of microbial nutrients – bacterial growth curve - Diauxic growth – classification & nomenclature of enzymes – factors affecting enzyme activity - EMP – HMP – ED pathways, TCA cycle – ATP production – protein synthesis – fermentation – fatty acid oxidation – short seminar classes – debates of selected topics of the course – discussion of previous year question papers.

## 22SCCMB2 - Microbial Physiology -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	2	2	3	3
CO3	3	2	2	2	3
CO4	2	3	3	2	3
CO5	3	3	3	3	3
Optimum Point	3	3	3	3	3

  
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## CORE PRACTICAL II

### MICROBIAL PHYSIOLOGY

#### COURSE OBJECTIVES:

- To provide the students hands-on practice on the first-line microbial physiology experiments.
- To train the learners to independently test various carbohydrate fermenting abilities of microbes.
- To make the students to understand the principles of significant biochemical tests done to identify bacterial isolates.
- To educate microbial growth experiments and their impacting factors.
- To provide hands- on experience of microbial cultivations by different methods.

#### EXPERIMENTS:

1. Bacteria & carbohydrate fermentation tests: Glucose, Lactose, Sucrose and Mannitol.
2. Biochemical tests to identify bacterial isolates - IMViC test, Oxidase test, Catalase test, Urease test, TSI test
3. Enzymatic Hydrolysis of Starch & Casein by selective bacterial isolates.
4. Bacterial (Escherichia coli) Growth curve: Cell count
5. Measurement of Microbial growth –Turbidity methods.
6. Studying the influence of temperature & pH on the growth of test bacteria.
7. Anaerobic bacterial cultivation - candle jar method.



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## 22SCCMB2P - MICROBIAL PHYSIOLOGY (Practical)-Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3
CO2	2	2	2	2	2
CO3	3	3	3	3	3
CO4	3	2	3	2	2
CO5	3	3	3	3	3
Optimum Point	3	3	3	3	3

  
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## FIRST ALLIED COURSE II

### GENERAL BIOCHEMISTRY

#### COURSE OBJECTIVES

- To provide basic understandings of cell structural compositions.
- To teach biochemical nature and functions of microbes.
- To study the basics of bio-molecules' synthesizing mechanisms and regulations.
- To know the biological energy sources and transferring molecules.
- To understand the molecules involved in metabolic functional systems.

#### UNIT – I Cell and Its Function:

Composition of living matter. Biochemistry of microbial, plant and animal cells. Specialized components of microorganisms and their structure and function.

#### UNIT – II Enzymes:

Enzymes as biocatalysts, enzyme classification, specificity, active site, unit activity, isozymes. Enzyme kinetics: Michaelis Menton equation for simple enzymes. Enzyme inhibition.

#### UNIT – III Types of Macromolecules and Properties:

Structural features and chemistry of macromolecules. Nucleic acid –Structure of DNA and RNA; functional properties. Proteins – classification – Amino acids - primary-secondary-tertiary – quaternary and three-dimensional structure of proteins. Carbohydrates - mono, di, oligo and polysaccharides. Lipids and biomolecules: Fatty acids, properties, -oxidation and reduction reactions.

#### UNIT – IV Biosynthesis of Macromolecules:

Nucleic acids: biosynthesis of purines and pyrimidines. Proteins – biosynthesis from DNA. Fatty acid biosynthetic pathways. Biosynthesis of cholesterol. Assembly of carbohydrate from monomeric structures and the enzyme involved in the synthesis.





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## UNIT – V Bioenergetics:

Bioenergetics and strategy of metabolism - flow of energy through biosphere, strategy of energy production in the cell. Oxidation – reduction reactions, coupled reactions and group transfer. ATP production, structural features of biomembranes, transport, free energy and spontaneity of reaction,  $G$ ,  $G^\circ$ ,  $G'$  and equilibrium. Basic concepts of acids, base, pH and buffers.

### 22SACMB2 -General Biochemistry - Mapping

1= Slight (Low) 2= Moderate (Medium) 3 = Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	-	1	-	-
CO2	-	-	-	-	-
CO3	3	2	2	3	3
CO4	2	2	2	3	2
CO5	-	-	-	-	-
Optimum Point	3	2	2	3	3

  
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## CORE COURSE III INTRODUCTORY VIROLOGY

### COURSE OBJECTIVE:

- To facilitate in understanding basics of viruses and their discovery.
- To impart the structure and classification of viruses.
- To teach about virus assay and diagnostics.
- To provide the fundamentals of bacteriophages.
- To understand the important features of plant viruses and common properties of human viruses.

### UNIT – I General Virology:

Virus – History of Virology - General properties of Viruses – Classification of Viruses (LHT, Baltimore and ICTV) - Ultra structure of Viruses – Sub viral agents - viroids, prions, virusoids and satellite viruses – Replication of Viruses.

### UNIT – II Diagnostic Virology and Control of Viruses:

Cultivation of viruses- Embryonated eggs and Primary and secondary cell cultures. Serological methods- hemagglutination, hemagglutination inhibition, complement fixation, immunofluorescence, ELISA, RIA and assay of viruses. Purification, Characterization, Separation and Assay of Viruses. Viral Vaccines antiviral drugs, Interferons.

### UNIT – III Phages:

Bacteriophages - Classification - Structure and life cycle of T4 Phage, Lambda Phage and M13 Phage-lytic and lysogenic Life cycles - Bacteriophage typing - Cyanophages, Microphages and cultivation strategies of phages from sewage.

### UNIT – IV Human Viruses:

Classification - Structure, Multiplication, Pathogenesis, Diagnosis, Prevention and Treatment of following animal viruses – Polyomaviridae (Simian Virus – 40), Herpesviridae (HSV 1), Pox viridae (Small Pox), Hepadnaviridae (HBV), Picornaviridae (HAV), Rhabdoviridae (Rabies virus), Orthomyxoviridae (Influenza Virus), Retroviridae (Human Immuno Deficiency virus), Filoviridae (Ebola virus), Flaviviridae (Dengue Virus) and Coronaviridae (SARS-CoV2).

### UNIT – V Plant Viruses:

Classification– Transmission of plant viruses – Symptoms of Viral infection in plants - Control of plant viral diseases. Detailed study of TMV and CaMV Common viral diseases in paddy, cotton, tomato and sugar cane - Name of diseases, pathogens and symptoms. Cultivation of Plant Viruses. Vector control.

### UNIT – VI Current Contours (For continuous internal assessment only):

Method of analyzing viral infection in a community. How to control viral spread in a community. Infection control system in a community.



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## 22SCCMB3 – INTRODUCTORY VIROLOGY MAPPING

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3
CO2	3	3	2	1	-
CO3	3	2	2	3	3
CO4	3	2	1	-	2
CO5	3	1	1	-	2
Optimum Point	3	2	2	1	2

  
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## CORE PRACTICAL III INTRODUCTORY VIROLOGY

### COURSE OBJECTIVES:

- To teach the methods of isolation, concentration and titration of phages.
- To impart the knowledge of plant virus infection.
- To provide a knowledge of human viral diseases and the role of advanced techniques in viral diagnosis.
- To expose the learners to the methods of animal viral cultivation.
- To describe the symptoms of human viral diseases.

### EXPERIMENTS:

1. Isolation and characterization of bacteriophage from natural sources.
2. Determination of Phage Titre.
3. Study of virus infected plant samples - Study any 5 Plant virus symptoms
4. Cultivation of Animal Viruses - Embryonated Egg.
5. Study on the symptoms of human viral disease Small pox, Chicken Pox, Monkey pox, Mumps and Measles.

### 22SCCMB3P - Introductory Virology-Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3
CO2	3	2	1	3	2
CO3	3	2	2	3	2
CO4	3	3	3	1	2
CO5	3	2	1	2	3
<b>Optimum Point</b>	3	2	2	2	2

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## SECOND ALLIED COURSE I

### BIOSTATISTICS

#### COURSE OBJECTIVES:

- To find numerical solutions to scientific data.
- To analyses and interpret scientific data using numerical and mathematical equations.
- To recognize the definition of statistics, the subject's relation with the other sciences.
- To know how to collect data relating to variable/variables.
- To calculate descriptive statistics for an appropriate data.

#### UNIT – I Introduction to Biostatistics:

Biostatistics - Definition, statistical methods, biological measurement, kinds of biological data, functions of statistics and limitation of statistics – Application of statistics in various field, biology, medicine, etc...

#### UNIT – II Data Collection and Representation:

Collection of data, sampling and sampling design, classification and tabulation, Variables vs. Attributes – Primary vs. secondary data - types of representations, Different types of chart and diagrams, graphic–bar diagrams, pie diagrams and curves.

#### UNIT – III Central Tendency:

Measures of central tendency, mean, median, mode, geometric mean, harmonic mean, Quartile, Deciles, percentiles. (Concept formulae and their calculations)

#### UNIT – IV Dispersion & Deviation:

Measures of dispersion and variability-changes. Deviations–Mean Deviation, Standard Deviation, Coefficient of variation, Loren Zen's curve – Gini.

#### UNIT – V Skewness and ANOVA:

Skewness, Kurtosis, Moments, Meaning, test of skewness, characteristics of dispersion and skewness. Measures of skewness, objectives. Karl Pearson's Coefficient of skewness, Bocolley's coefficient of skewness. Software's - ANOVA, SPSS, Sigma plot.

Unit – VI Current Contour (For continuous internal assessment only): Literature seminar on Biostatistics and its detailed application for all students. Group discussion on How Biostatistics play an important Role on recent day science. – Give a work to the students to know about best statistical research centres and institutes in India. Demonstration of Statistical tools available with the institute.



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## 22SACMB3 – Biostatistics -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	3
CO2	2	1	2	-	2
CO3	2	-	2	2	3
CO4	-	2	1	-	2
CO5	2	2	2	2	-
Optimum Point	2	1	2	1	2

  
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## SECOND ALLIED PRACTICAL

### BIOSTATISTICS & BIOINFORMATICS AND COMPUTATIONAL BIOLOGY

#### COURSE OBJECTIVES:

- To provide foundational skills and knowledge in biostatistics as to gain a deeper understanding
- To introduce probability and sampling distributions
- To analyse quantitative and qualitative data using biostatistics
- To interpret results of data analysis
- To appraise how quantitative and qualitative data can be integrated into mixed methods

#### EXPERIMENTS:

1. Collection of data, sampling designs, tabulation and graphic representation using biological materials.
2. To find Mean, Mode, Median, Co-efficient of variance using biological materials.
3. Tests of significance 't' test, 'chi' square, standard error and standard deviation.
4. 't' Test, chi square, statistical error, standard deviation also, to be practically done through SPSS programme [Statistical Package for Social Sciences].
5. F – test
6. ANOVA
7. Study of Nucleic acid sequence databanks – GenBank, EMBL nucleotide sequence databank, DDBJ.
8. Study of Protein Structure and Classification databases – PDB, SCOP and CATH.
9. Multiple sequence alignment - ClustalW.
10. Evaluation of protein structure by Swiss PDB viewer and RASMOL
11. Sequence alignment - Local and global, pair wise and multiple, BLAST.



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## 22SACMB2P – Biostatistics & Bioinformatics and Computational Biology -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	-	1	-	1	-
CO2	-	-	-	-	-
CO3	-	2	-	2	-
CO4	-	-	-	-	-
CO5	-	2	-	3	-
Optimum Point	-	1	-	1	-

  
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## NON MAJOR ELECTIVE I CLINICAL BACTERIOLOGY

### COURSE OBJECTIVES:

- To provide information on common pathogenic bacteria.
- To understand pathogenicity of bacterial agents
- To understand disease causing process and identification of intracellular and extracellular pathogens
- To describe sterilization and antibiotic sensitivity methods
- To know the basic concept of water quality assessment.

UNIT – I: Historical development in Bacteriology, Classification of Pathogenic bacteria, General methods of isolation and identification of pathogenic bacteria.

UNIT - II: Infections associated with following Gram-positive bacteria – Bacillus anthracis, Clostridium tetani, Pneumococcus, Corynebacterium diphtheriae, Streptococcus pyogenes, Staphylococcus aureus

UNIT – III: Infections associated with following Gram-negative bacteria – Enterobacteriaceae – Salmonella typhi, Shigella sonnei, Klebsiella pneumoniae, Proteus vulgaris, Yersinia pestis and Escherichia coli, Vibrio cholerae, Pseudomonas aeruginosa, Neisseria gonorrhoea, Haemophilus influenzae, C. Bordetella, Brucella.

UNIT IV Infections associated with Mycoplasma, Mycobacterium tuberculosis and Mycobacterium leprae. Spirochetes – Treponema, Borrelia and Leptospira. Actinomycetes. Rickettsiae, Chlamydiae, Bordetella and Brucella.

UNIT V Nosocomial infections and Zoonotic diseases, Sterilization, disinfection and antimicrobial chemotherapy, culturing Techniques and sensitivity Testing; MPN count for water Quality.

Unit – VI Current Contour (For continuous internal assessment only): Review on recent bacterial infections in a community. Methods to control infection in a community.



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## 22SNMEMB1 – Clinical Bacteriology -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3
CO2	3	2	3	3	3
CO3	3	2	3	3	2
CO4	3	1	2	3	2
CO5	3	1	2	3	2
Optimum Point	3	2	3	3	2

  
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## CORE COURSE IV

### IMMUNOLOGY

#### COURSE OBJECTIVES:

- To provide the various components of the host immune system.
- To understand structural organization and functions of immune organs and cells.
- To present the activities of T and B cells.
- To impart the process and properties of antigens and antibodies' reactions.
- To describe the immune reaction with reference to transplantation and autoimmunity.

UNIT – I Immune System: History of Immunology, Immunity - innate and acquired. Inflammation. Haematopoiesis – Blood Group System, Cells of the immune system. Lymphocytes, macrophages, mononuclear phagocytes-dendritic cells, granulocytes, NK cells and mast cells Central and peripheral lymphoid organs. Thymus, bone marrow, spleen, lymph nodes, MALT and GALT.

UNIT – II T and B cell: Detailed structure and development of B cell and T cell – receptors - Activation of T and B cells- Maturation of T cell and B cell. Cytokines and Plasma cells. Organization of the genes for B and T cell receptors. Genetic organization of MHC-I and MHC-II complex (both HLA and H-2).

UNIT – III Antigen Antibody: Antigen – Types, Toxoid-vaccines – Antibody – types of antibody. Cell mediated immunity – Humoral mediated immunity – Theories of antibody formation. Antibody biodiversity.

UNIT – IV Ag-Ab Interactions: Antigen antibody reactions - Precipitation, agglutination, complement fixation, RIA, ELISA, Western blotting and immunofluorescence. Production of polyclonal and monoclonal antibodies.

UNIT – V Immune Mechanisms: Complement system: Basics of complement protein - different pathways of complement activation - classical and alternative. Hypersensitivity reaction and their types. Auto immune disorders, transplantation and cancer immunology. Deficiencies / defects of T cells, B cells, and phagocytic cells. Immunity to tuberculosis, malaria and HIV.

Unit – VI Current Contours (For continuous internal assessment only): Review and debate on latest discovery on immunology; Seminar on immune responses against SARS-CoV2 and vaccination for COVID19.

## 22SCCMB4- IMMUNOLOGY-MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	2	1
CO2	3	1	1	2	1
CO3	3	1	2	3	2
CO4	3	2	2	2	-
CO5	3	1	2	2	-
Optimum Point	3	1	2	3	1

  
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## CORE PRACTICAL III IMMUNOLOGY

### COURSE OBJECTIVES:

- To provide hands- on training on the basics to advanced techniques in immunology.
- To teach about blood and to train in blood collection, serum separation.
- To explain blood cell count and its differentiation
- To describe about agglutination and precipitation methods.
- To make the learners understand immune electrophoresis.

### EXPERIMENTS:

1. Collection of venous blood from human.
2. Preparation of serum and plasma.
3. Total count (RBC and WBC).
4. Differential Count (WBC).
5. Dissection of primary and secondary lymphoid organs in a selected animal.
6. Haemagglutination - ABO Blood grouping.
7. Agglutination reactions – WIDAL, RPR, CRP.
8. Precipitation reactions: Single and Double immune diffusion.
9. Immuno-electrophoresis: Counter current and Rocket immuno electrophoresis.



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## 22SCCMB4P – IMMUNOLOGY -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	3	3	2
CO2	3	1	3	2	2
CO3	3	-	2	2	1
CO4	2	-	3	3	-
CO5	3	-	2	2	-
Optimum Point	3	1	3	3	1

  
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## SECOND ALLIED COURSE II

### BIOINFORMATICS AND COMPUTATIONAL BIOLOGY

#### COURSE OBJECTIVES

- To introduce the rapidly evolving field of Bioinformatics.
- To transfer basic knowledge of computers and internet.
- To teach the computational methods as to utilize expression data of cellular biology.
- To study of the inherent structure of biological information.
- To analyse the gene and protein sequences as to reveal protein evolution.

#### UNIT – I Basics of Computer:

Computers – Characteristics of Computers – Areas of computer applications- I-PO Cycle. Components of Computers – Memory and control units-Input devices and output devices- Hardware and Software -Operating Systems. Languages – Basics, Windows, Unix and Linux.

#### UNIT – II Web and Browsers:

Internet-History of Internet-Uses of internet. Connection to Internet-Getting connection-Web page- www, websites, URL, browsers, search engines, Modem- Internet Service Providers-E-mail and Voice Mail, Creating E-mail Address, IoT Internet of Things.

#### UNIT – III Basics of Bioinformatics:

Introduction to bioinformatics – history and its development – Scope and applications of bioinformatics. Computer aided drug design, docking, screening. Bacterial identification system. Applications of computational biology.

#### UNIT – IV Databases and Phylogeny:

Biological database – NCBI-GenBank, EMBL, DDBJ. DNA Sequence analysis, Sequence Alignment-Pairwise (BLAST and FASTA and its features) and Multiple sequence alignment (ClustalW) – PAM matrix - Conservation score, Phylogenetic trees

#### UNIT – V Proteomics:

Structure of Protein, Classification –PDB, Swiss-PROT, SCOP, CATH. Protein visualization tools-RASMOL, Swiss PDB viewer. – three kinds of protein structures, protein sequence analysis, hydrophobicity profiles – Ramachandran plot.



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UNIT – VI Current Contours (For continuous internal assessment only):

Give a Literature seminar on Computational biology and its importance in the field of Microbiology for all students.  
– Group discussion on biological software's – to learn about computational research centres and Institutes all around the world. Demonstrate the students with basics of protein structure visualization tools and the different models of proteins. Experience them with the updated versions of Nucleotide databases

## 22SACMB4 – Bioinformatics and Computational Biology -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	-	1	-	1	-
CO2	-	-	-	-	-
CO3	-	1	-	2	-
CO4	-	-	-	-	-
CO5	-	2	-	3	-
Optimum Point	-	1	-	1	-

  
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## NON MAJOR ELECTIVE II

### ANTIMICROBIAL AGENTS

#### COURSE OBJECTIVES:

- To educate clinically significant antimicrobial agents and their mechanisms of drug resistance.
- To isolate and identify the novel antimicrobial resistant organisms.
- To learn about antimicrobial drugs and their mechanisms.
- To produce new antimicrobial drug against various diseases.
- To create an awareness on the studies of antimicrobial resistance among the students.

#### UNIT – I Introduction of Antimicrobial Agents:

Definition – disinfection – antiseptics – antibiotics – chemical agents (antibacterial, antifungal, antiviral and antiparasitic) – non pharmaceutical agents (essential oils) – physical agent (Ozone, heat, radiation).

#### UNIT – II Antibacterial Agents:

Antibacterial agent - mechanism of action- cell wall synthesis inhibitor (penicillin, arabinoglycan), protein synthesis inhibitor (Tetracycline, Chloramphenicol), nucleic acid synthesis inhibitor (metronidazole, rifampin), alteration of cell membranes (gramicidin, polymyxin, antimetabolite (sulfanilamide).

#### UNIT – III Antiviral Agents:

Antiviral agents - interferon – types- mechanism of action - amantadine, rimantadine, zanamivir, and oseltamivir - viral vaccines.

#### UNIT – IV Antifungal Agents:

t-mode of action- amphotericin, nystatin and fluorocytosine. Antiprotozoal agents – mechanism of action – (Metronidazole – chloroquine, Paromomycin sulfate, – quinolines).

#### UNIT – V Drug Resistance:

Emergence of drug resistance – bacteria, fungi and viruses. Alternative drugs - antimicrobial peptides.

#### UNIT – VI Current Contours (For internal assessment only):

The Demand for Antibiotics: Antimicrobial Peptides, Nanoparticles, and Combinatorial Therapies as Future Strategies in Antibacterial Agent Design. Novel Antimicrobial Agents: Discovery, Design and New Therapeutic Strategies.



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## 22SNMEMB2 – Antimicrobial Agents -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	1
CO2	2	3	2	3	2
CO3	2	3	2	3	1
CO4	3	3	2	3	1
CO5	2	3	2	3	1
Optimum Point	3	3	3	3	1

  
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## CORE COURSE V

### MEDICAL MICROBIOLOGY

#### COURSE OBJECTIVES

: • To make the students understand normal flora, host parasite interactions and epidemiology of infectious diseases.

- To acquire a basic understanding of the common infections
- To understand the diseases of medical importance, their microbial causes, pathogenic action.
- To diagnose infection associated with microbial infection.
- To understand the fungal and protozoan diseases and preventive measures

#### UNIT – I

Introduction to Medical Microbiology: History of Medical Microbiology - Classification of medically important microbes - Normal microbial flora of the human body-Host bacterial interactions – Nosocomial and community acquired infections – Epidemiology of infectious diseases.

#### UNIT – II

Medical Bacteriology: Morphological, cultural and biochemical characteristics of and epidemiology, mechanism of bacterial pathogenesis, lab diagnosis, prophylaxis and control of medically important diseases caused by: Staphylococcus aureus, Group A Streptococci, Corynebacterium diphtheriae, Clostridium tetani, Treponema pallidum, Mycobacterium tuberculosis, Escherichia coli, Vibrio cholerae, Niesseriae gonorrhoea, Haemophilus influenza, Zoonotic bacterial diseases.

#### UNIT – III

Medical Mycology: Morphological and cultural characteristics of and epidemiology, mechanism of fungal pathogenesis, lab diagnosis and treatment of medically important diseases caused by: Superficial mycosis – Tinea versicolor. Cutaneous mycoses: Microsporum, Trichophyton, Epidermophyton. Subcutaneous mycoses: Sporotrichosis, Chromoblastomycosis. Systemic Mycoses – Histoplasma capsulatum and Cryptococcus neoformans,

#### UNIT – IV

Medical Virology: General properties of and epidemiology, pathogenesis, lab diagnosis and treatment of medically important viral diseases - Measles, Mumps, Rubella, Chicken Pox, Hepatitis A, B,C, D and E, Poliomyelitis, HIV, Rabies, Yellow fever, Dengue and Covid 19. Brief note on oncogenic viruses. Antiviral drugs, antiviral vaccines.



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## UNIT – V

Medical Parasitology and Diagnostic Microbiology: Morphology of, and pathogenesis, laboratory diagnosis and treatment of medically important protozoan diseases amoebiasis, giardiasis, malaria, Kala-azar, filariasis, Ascariasis and Fascioliasis. Diagnosis of protozoal and helminthic disease of Human. UNIT – VI Current Contours (For continuous internal assessment only) : Making awareness and celebration of world AIDS day, World TB, cancer Day, Pulse polio immunization day etc., awareness programme on personal hygiene and vaccination

### 22SCCMB5-Medical Microbiology - Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	1
CO2	3	3	3	3	1
CO3	2	3	2	1	1
CO4	3	2	1	3	1
CO5	2	2	1	3	1
Optimum Point	3	3	2	3	1

  
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## CORE COURSE-VI

### ENVIRONMENT AND AGRICULTURAL MICROBIOLOGY

#### COURSE OBJECTIVES:

- To communicate the students with basic principles of microbiology and their applications to environment and agriculture.
- Students will be able to know extremophilic microorganisms and their significant role.
- To know the type of waste disposing mechanisms using microbial sources.
- To provide the fundamental knowledge pertaining to the various scopes of agricultural and environmental microbiology.
- Students will learn the course concepts of plant diseases, aeromicrobiology, aquatic microbiology, disposal of wastes and commercial aspects of soil microbiology.

#### UNIT I Microbiology of Air and Extremophiles:

Distribution and sources. Droplet nuclei, aerosol, assessment of air quality. Brief account of air borne transmission of harmful microbes. Concepts of microbial ecology

- Relationship between microorganism and different environments land, water and air. Extremophiles – Thermophiles, mesophiles, psychrophiles, Deep-sea, Desert, Acidophilic, Alkalophilic and Halophilic microorganisms

#### UNIT II Microbiology of Water:

Different kinds of water. Physico-chemical properties of water, brief account of water borne diseases, microbial assessment of water quality, water purification, brief account of water borne diseases. Aquatic micro flora and fauna of lake, ponds, river, estuary, mangrove and sea.

#### UNIT III Wastes and Its Management:

Types of wastes – characterization of solid and liquid wastes. Solid waste treatment – saccharification – gasification – composting, Utilization of solid wastes for mushroom production. Liquid waste treatment - Treatment methods– primary and secondary (anaerobic – methanogenesis) aerobic: trickling, activated sludge, oxidation pond – tertiary treatment.

#### UNIT IV Microorganisms in Agriculture:

Microorganisms in the rhizosphere, root surfaces and phylloplane –Biofertilizer-Advantages over chemical fertilizers, types, production and - quality control of biofertilizers - Isolation, mass inoculum production, field application. Types of biofertilizers - Rhizobium, Azotobacter, Azospirillum, Cyanobacteria, Azolla, Mycorrhizae, Frankia. Biological nitrogen fixation.

**UNIT V Plant Diseases:**

Mode of entry of pathogens, Symptoms, Disease cycle and control measures. Different types of plant diseases - Tobacco mosaic, Bacterial blight of paddy, Downy mildew of bajra, Powdery mildew of cucurbits, Head smut of sorghum, Red rot of sugar cane, Citrus cancer, Downy mildew of bajra, Powdery mildew of cucurbits. Microbial Pesticides – types and applications. Integrated Pest and Disease Management (IDPM).

**UNIT VI Current Contours (For continuous internal assessment only):**

Assignment shall be given based on the syllabus and seminar was subjected to students related to their assignment topics individually. A group project shall be assigned in the topic of assessment of microorganisms in air. Mini project in various recent research topics related to the course shall be given.

**22SCCMB6 - Environment and Agricultural Microbiology - MAPPING**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	2	2	2	2	2
CO3	3	2	1	2	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Optimum Point	3	3	3	3	3



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## CORE COURSE-VII

### MOLECULAR BIOLOGY AND MICROBIAL GENETICS

#### Course Objectives:

- To provide the students with the fundamental principles and concepts of prokaryotic genes and genomes.
- To study about the molecular organization, replication and functions of gene and genome.
- To understand the genetic transfer mechanisms in microbes.
- To learn about the mutation and mutagenesis.
- To know about the mechanisms of DNA replications and its Repairing.

#### UNIT - I Genetic Material and Its Structure:

Milestones in history – Definition of nucleic acids - Experimental proofs of DNA as the genetic material (Griffith and Hershey Chase) – Experimental proofs of RNA as the genetic material - Chemistry and molecular structure of DNA double helix - Discovery of DNA structure – Brief account on types and forms of DNA – Types of RNA - Definition of a gene. Organization of DNA in prokaryotes (E. coli) and viruses. Brief note on plasmids: Extra chromosomal elements – Plasmid and transposons, Brief note's structure and types.

#### UNIT - II DNA Replication and Its Mechanisms:

DNA Replication in prokaryotes: Meselson and Stahl experiment – Mechanism, enzymes and proteins of replication – Theta replication and Rolling circle replication. Replication of DNA – semi conservative mechanisms, enzyme involved in replication – Replication of RNA – reverse transcriptase - cloning and its mechanisms-hybridization.

#### UNIT - III Transcription and Translation:

DNA Transcription: Definition – Brief account on transcriptional machinery and mechanism of transcription – Genetic code – RNA Translation: Definition – Brief account on translational machinery and mechanisms of translation. Regulation of gene expression in prokaryotes – Operon concept – lac and trp operons.

#### UNIT – IV Transformation:

Transformation - Discovery, mechanism of natural competence - Conjugation - Discovery, F+ v/s F-, Hfr+ v/s F- - Transduction – Generalized and specialized transductions.

#### UNIT – V Mutation and Mutagenesis:

Definitions of mutations, mutagenesis and mutants - types of mutations; Physical and chemical mutagens. Transposons - Applications of mutations, Carcinogenicity testing. DNA repair mechanisms. Immuno precipitations.



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## UNIT – VI Current Contours (For continuous internal assessment only):

Group discussion on Molecular Biology related recent invention and research, give a seminar on each student from Microbial genetics related topics. Demonstrate them the importance of Horizontal Gene Transfer in Natural Selection and Evolution.

### 22SCCMB7-Molecular biology and Microbial genetics - Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	3
CO2	3	3	2	3	3
CO3	2	3	3	2	3
CO4	2	3	3	3	2
CO5	3	3	2	3	3
Optimum Point	3	3	3	3	3

  
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## CORE PRACTICAL V

### MEDICAL MICROBIOLOGY, ENVIRONMENT AND AGRICULTURAL MICROBIOLOGY AND MOLECULAR BIOLOGY & MICROBIAL GENETICS

#### COURSE OBJECTIVES:

- To provide hands- on training in identifying bacteria using culture media
- To handle clinical specimen for fungal infection diagnosis
- To handle microscopic methods to diagnose protozoa and helminth infections.
- To impart hands- on training in conventional methods of microbial identification.
- To perform antibiotic sensitivity assay.

#### EXPERIMENTS:

1. Isolation and identification of Staphylococcus aureus from pus.
2. Isolation and identification of Salmonella from stool.
3. Isolation and identification of E. coli from urine.
4. Antibiotic susceptibility test – Disc diffusion method (Kirby –Bauer).
5. Identification of Candida albicans
6. Saline and Iodine wet mount to detect cysts, trophozoites and eggs.
7. Giemsa staining to detect blood parasites
8. Enumeration of microorganisms from air by open plat technique.
9. Isolation and identification of air-borne microbes using Andersen sampler.
10. Isolation of phosphate solubilizing bacteria from soil
11. Assessment of water quality by MPN technique
12. Screening of antagonistic bacteria in soil by agar block overlay method.
13. Enumeration of microbial population from rhizosphere and non-rhizosphere soil
14. Isolation of Azospirillum and Azotobacter from soil
15. Isolation of Rhizobium sp. from root nodules of legumes
16. Evaluation of root nodule by cross section of legume roots.
17. Isolation of Cyanobacteria from agricultural soil and water
18. Isolation of bacterial and fungal pathogens from plants.



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19. Prevalence of Arbuscular Mycorrhizae (AM) in infected plants.
20. Demonstration of the plant diseases: a) Bacterial blight of paddy; b) Powdery mildew of cucurbits; c) Red rot of sugar cane; d) Citrus cancer;
21. Isolation of chromosomal DNA from bacteria
22. Isolation of plasmid DNA from bacteria
23. Isolation of microbial Genomic RNA
24. Quantification of DNA and RNA by Spectrophotometric method
25. Isolation of Auxotrophic mutants.
26. Demonstration of bacterial transformation technique.
27. Demonstration of Agarose gel electrophoresis (to study DNA/ RNA) and SDS – PAGE (to study proteins).

## 22SCCMB5P - Medical Microbiology, Environment and Agricultural Microbiology and Molecular Biology & Microbial Genetics -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3
CO2	3	1	2	2	3
CO3	2	2	2	2	3
CO4	2	2	1	2	2
CO5	2	2	2	2	2
Optimum Point	3	2	2	2	3

  
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## MAJOR BASED ELECTIVE I DIAGNOSTIC MICROBIOLOGY

### OBJECTIVES:

- To impart the students with the knowledge of various clinical specimen collection from human cases.
- To provide the basics of clinical pathology and hematology.
- To expose the students to microbiological, biochemical, immunological and molecular scrutinization so as to diagnose specific clinical abnormalities among human patients.
- To provide methods of handling instruments, principle and advantages of diagnostics.
- To know the diagnostic challenges of the mycological diseases.

### UNIT – I Clinical Specimen Collection and Investigation:

Human clinical specimens – methods of collection, processing, transport and their storage – Throat swab, Blood, Urine, Stool, Sputum, pus & body fluids (CSF, ascetic fluids). Microscopic identification of bacterial pathogens – urine & pus specimens – differential staining and motility.

### UNIT – II General Clinical Pathology and Haematology:

Preparation, staining & examination of human blood smear and morphological abnormalities. RBC count & Differential WBC count – Reticulocyte count- absolute eosinophil count – E.S.R, P.C.V, Blood indices - Platelet count: BT, CT - Prothrombin time, APTT, FDP estimation.

### UNIT - III: Urine Specimen and Molecular Diagnosis

Human urine examination: physical and chemical tests, microscopic examination – crystals, casts, sediments, pregnancy tests – Diagnostic protocol of urinary tract infection. Advanced diagnostic techniques (outline of the protocol) – ELISA, Western blot analysis for HIV, RT-PCR for Covid 19. Antimicrobial susceptibility testing— Kirby Bauer Disc diffusion method - reporting of results and their interpretation.

### UNIT – IV Stool Specimen and Mycology Lab:

Human stool examination – Physical, Chemical and Microscopic examination and their significance. Laboratory methods in basic Mycology-Direct Microscopic examination of clinical specimens and culture media. Serological tests for fungi - Antifungal susceptibility testing.

### UNIT – V Sputum Specimen and Parasitological Lab:

Sputum examination: Microscopic examination – Diagnostic protocol of Respiratory tract infections (Upper and Lower). Laboratory methods for parasitic infections – Diagnostic technique from faecal specimen. Identification of Protozoa – Amoebiasis and Malaria.



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## UNIT – VI Current Contours (For continuous internal assessment only):

A visit to a diagnostic laboratory/ hospital/ primary health care center - Internship at a diagnostic lab for 'one day' - assignments on clinical specimens' collection & processing - viral infections - Detection of viral antigen (fluorescent antibody and solid phase immunoassays) - viral serology - antimicrobial susceptibility testing and results interpretation - Throat swab, Blood, Urine microbiological examination steps/ stages for each - ELISA - western blot - RT- PCR - Literature seminar topics representing each unit - Debate on PCR & disease diagnosis.

### 22SMBEMB1A - Diagnostic Microbiology- MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	1
CO2	2	3	2	3	1
CO3	2	3	2	3	1
CO4	3	3	2	3	1
CO5	2	3	2	3	1
Optimum Point	2	3	3	3	1

  
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## MAJOR BASED ELECTIVE I 2. PHARMACEUTICAL MICROBIOLOGY

### COURSE OBJECTIVES:

- To provide the basics of antimicrobials' assessment procedures & mode of action of antibiotics
- To instruct the learners with the methods of sterilization and sterility testing of various pharmaceutical articles/products.
- To impart proficiency on the production and quality control of prophylactic compounds
- To transfer skills required to control pharma products' microbial contamination and role of cell culture in pharmacy.
- To study the food and drug administration regulations to create awareness.

### UNIT – I Antimicrobials:

Natural and synthetic antibiotics - Laboratory assessment of a new antibiotic - Testing of antimicrobial activity of a new substance - Mechanism of action of antibiotics - Methods for standardization of antibiotics, vitamins and amino acids.

### UNIT – II Sterilization & Sterility:

Sterility testing of pharmaceutical products – Injectables – IV fluids – Solids – Ophthalmic – Pyrogen testing. Antiseptics, disinfectants and their standardisation. Evaluation of the efficiency of sterilization methods - Equipments employed in large scale sterilization - Sterility indicators.

### UNIT – III Immunologicals:

Preparation and quality control of products representing various categories - Toxoids: Diphtheria and Tetanus, Live Bacterial Vaccines: BCG, Killed Bacterial Vaccines: Cholera & DPT. Viral Vaccines: Polio, Rabies and small pox, Antitoxins – Diphtheria. Preparation of Antisera and their standardization.

### UNIT – IV Antimicrobials – Bioassay, Contamination & Testing:

Bioassay of antibacterial agents in liquid media and in agar media based on standard CLSI guidelines - Microbial contamination and spoilage of pharmaceutical products – infection risk and contamination control - and their sterilization – In vitro methodologies for testing of antibacterial, antifungal and antiviral drugs.

### UNIT – V FDA, Cell Culture & Applications:

Food and Drug Administration (FDA) guidelines for drugs - Validation: GMP & GLP - Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations. Growth of animal cells in culture, Primary, established and transformed cell cultures. Application of cell cultures in pharmaceutical industry and research.

### UNIT – VI Current Contours (For continuous internal assessment only):

A visit to a pharmaceutical industry / pharmacy institution - Assignments on highly significant topics across the five units & any latest developments in pharmaceutical microbiology (new vaccine technology after COVID 19) - Discussion on redressing antimicrobial resistance through industry- Quiz classes - short seminar classes – debates of selected topics of the course – discussion of previous year question papers.



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## 22SMBEMB1B - Pharmaceutical Microbiology - MAPPING

1: Slight(Low) 2:Moderate(Medium) 3:Substantial(High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3
CO2	3	1	2	2	3
CO3	2	2	2	2	3
CO4	2	2	1	2	2
CO5	2	2	2	2	2
Optimum Point	2	2	2	2	3

  
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## SKILL BASED ELECTIVE I MUSHROOM TECHNOLOGY

### COURSE OBJECTIVES:

- The course contents are designed as to gain basic science knowledge of mushroom cultivation.
- The learners will understand the nutritional benefits of the microbes concerned and also related drawbacks.
- Learners can acquire knowledge about the prevailing market demands and scope of these technologies.
- They will learn to apply the gained knowledge for strain improvement to support their entrepreneurship talents.
- Students can develop their knowledge to start an industry as an entrepreneur.

### UNIT – I Applied Mushroom Biology:

Introduction and Definition of a Mushroom, Mushroom Hunting, Ecological Classification of Mushrooms, Magnitude of Mushroom Species. Mushroom Science -Food Supply through Mushroom Themselves, Mushroom technology. Mushroom spoilages and mushroom borne diseases.

### UNIT – II History of Mushroom Cultivation:

Biology of mushrooms; Nutritional value: (Proteins, amino acids, mineral elements, carbohydrates, fibers, vitamins); Medicinal value of mushrooms; Poisonous mushrooms and mushroom poisoning; edible mushrooms and cultivation in India and world; Mycorrhiza mushrooms and their role in plant growth.

### UNIT – III Cultivation Technology:

Infrastructure, equipment and substrates required for mushroom cultivation: Polythene bags, vessels, inoculation hook, inoculation loop, love cost stove, sieves, culture racks, mushroom unit or mushroom house, water sprayer, tray, boilers, driers, pure culture, Spawns - types of spawn, preparation of spawn, mushroom bed preparation and factors affecting mushroom bed preparation. Compost - materials used for compost preparation, compost technology in mushroom production.

### UNIT – IV Casing and Mass Cultivation :

Casing - raw material used for casing, preparation of casing material; important sanitation during various stages of mushroom cultivation. Cultivation of important mushrooms - General process for the cultivation of *Agaricus bisporus*, *Pleurotus ostreatus* and *Volvariella volvacea*. Pests and Pathogens of mushrooms and their management with reference to *Agaricus bisporus*.

### UNIT – V Storage and Food Preparation from Mushrooms:

Methods of storage of mushroom cultivation, Long term and short term storage of mushrooms Foods/recipes from mushrooms. Mushroom research centres or farms - National level and regional level. Marketing of mushrooms in India and world.

### UNIT – VI Current Contours (For continuous internal assessment only):

Field trip to mushroom farms and research Institutes. Analysis of biological properties in the mushroom products. Awareness to the industrialists about the prevention of microbial contamination in the mushroom farms and products.



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## 22SSBEMB1 - Mushroom Technology - MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	2	2	2	2	2
CO3	2	2	2	2	2
CO4	2	2	2	2	2
CO5	1	1	1	1	1
Optimum Point	2	2	2	2	2

  
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## CORE COURSE VIII

### FOOD MICROBIOLOGY

#### COURSE OBJECTIVES:

- To learn the fundamental association between food and microbes.
- To acquire knowledge about the key concept of food fermentations
- To analyze the mechanism of food spoilage
- To understand the principles of food preservation.
- To enrich the knowledge of food quality control.

#### UNIT – I Food and Microbial Contamination:

Concepts of food and nutrients - Physicochemical properties of foods - Food and microorganisms – Importance and types of microorganisms in food (Bacteria, Mould and Yeasts) - Sources of contamination- Factors influencing microbial growth in food – pH, moisture, Oxidation-reduction potential, nutrient contents and inhibitory substances.

#### UNIT – II Food Fermentations:

Food Fermentations – Manufacture of fermented foods - Fermented dairy products (yoghurt and Cheese) - plant products- Bread, Sauerkraut and Pickles - Fermented beverages- Beer. Brief account on the sources and applications of microbial enzymes – Terminologies - Prebiotics Probiotics and synbiotics. Advantages of probiotics.

#### UNIT – III Fermented Food Products:

Contamination, spoilage and preservation of cereals and cereal products - sugar and sugar products -Vegetables and fruits- meat and meat products- Spoilage of canned food.

#### UNIT – IV Food Borne Diseases:

Food borne diseases and food poisoning – Staphylococcus, Clostridium, Vibrio parahaemolyticus and Campylobacter jejuni. Escherichia coli and Salmonella infections, Hepatitis, Amoebiasis. Algal toxins and Mycotoxins.

#### UNIT - V Food Preservation:

Food preservations: principles- methods of preservations-Physical and chemical methods- food sanitations- Quality assurance: Microbiological quality standards of food. Government regulatory practices and policies. FDA, EPA, HACCP, ISI. Food safety- control of hazards.



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## UNIT – VI Current Contours (for continuous internal assessment only):

Students may have a field visit to a food industry. Assignment, seminar and group discussion may be encouraged on Grain based fermented food - Koozhu, Pazhaiya soru, idli, dosa, Adai dosa, kallappam, dhokla etc.

### 22SCCMB8 - Food Microbiology -MAPPING

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2
CO2	2	2	2	2	2
CO3	2	2	2	2	2
CO4	1	1	1	1	1
CO5	1	1	1	1	1
Optimum Point	2	2	1	1	1

  
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## **CORE COURSE IX**

### **INDUSTRIAL MICROBIOLOGY**

#### **COURSE OBJECTIVES:**

To impart the knowledge of current technology as to produce microbial products from cheap sources.

- To present the nature of the industrially important microorganisms, up and down stream process, functions of the fermentors, primary and secondary metabolites as the products.
- To provide the students broad theoretical and practical skills in industrial microbiology.
- To explain the nature of the bio-resources, industrially important microorganisms, up and down stream process.
- To describe the functions of the fermentors, primary and secondary metabolites and production of recombinant products.

#### **UNIT – I Origin of Fermentation Industry:**

Historical development of Industrial Microbiology. Industrially important microorganisms - the range of fermentation process, chronological development, component parts of a fermentation process, fermentation economics. Isolation, screening, improvement, preservation and handling the microbial strains.

#### **UNIT – II Industrial Fermentation Media:**

Formulation strategies, economical means of providing energy, carbon, nitrogen, vitamin and mineral sources. Role of additional ingredients - buffers, precursors, chelators, inhibitors, inducers and antifoams. Sterilization of industrial fermentation media.

#### **UNIT – III Fermentor Design and Types:**

Body construction, mass transfer, heat transfer, oxygen transfer, stirring and mixing. Sterilization of a Fermentor vessels. Scale up and scale down fermentation process. Control of temperature, pH, form pressure Computer application in fermentation technology. Fermentation types- Submerged and solid state.

#### **UNIT – IV Downstream Processing:**

Intracellular and extracellular fermentations products. Recovery and purification of the products - removal of solid matters and biomass, cell disruption by physical and chemical methods, extraction of the products, chromatographic techniques, reverse osmosis, ultrafiltration, drying and crystallization of the products.



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## UNIT – V Production of Varying Microbial Products:

Organic acids - Amino acids, Antibiotics, Enzymes, Vitamins, Alcoholic beverages - wine and beer, Fermented foods - bread, cheese and soy sauce. Recombinant products-insulin. Fermentation products from molasses, starch wastes and cellulosic wastes. Recycling and disposal of industrial wastes through microbes.

## UNIT – VI Current Contours (For continuous internal assessment only):

Field trip to dairy, beverage Industry and food processing research Institutes. Analysis of microbiological quality in industrial products. Fermented food preparation. Awareness to the industrialists about the prevention of microbial contamination in industrial products.

### 22SCCMB9- Industrial Microbiology - MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put "--"

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2
CO2	3	3	3	2	2
CO3	3	3	3	3	2
CO4	2	3	3	3	2
CO5	2	3	3	3	2
Optimum Point	3	3	3	3	2

  
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## CORE PRACTICAL VI

### FOOD MICROBIOLOGY AND INDUSTRIAL MICROBIOLOGY

#### COURSE OBJECTIVE

- To study the basics of food microbiology processing
- To know the food quality assessment testing procedures.
- To learn about the different types of fermentation processes, equipment's used and microbiological processes involved.
- To provide the food contaminants possibility and causing agents.
- To realize significance and activities of microorganisms in food.

#### EXPERIMENTS:

1. Assessment of milk quality by methylene blue reduction test
2. Performance of phosphatase test for pasteurized milk.
3. Isolation of bacteria from food by Standard Plate Count method
4. Isolation of Yeast from grapes.
5. Wet mount preparation of spoiled bread, tomato, grapes, potato.
6. Observation of food samples to study *Leuconsostoc*, *Lactobacillus*, *Streptococcus lactis* and *Saccharomyes*.
7. Preparation of fermented food – Yoghurt and cheese (demonstration).
8. Screening of antibiotic producing microorganisms from soil.
9. Screening of enzyme producing organisms (e.g. Amylase and Cellulase).
10. Production of industrially important enzymes by solid state fermentation (Any one enzyme).
11. Production of wine from grapes.
12. Production of alcohol from agricultural wastes (sugarcane molasses and beetroot).
13. Characterization of alcohol: Nutritive value, Colour, Haze, Viscosity, foam Characteristics, gurtng flavor
14. Microbial production of citric acid by using *Aspergillus*.
15. Production, extraction and characterization of biosurfacta of biosurfactant (emulsification index, foaming index, oil spread nature and ionic characters).
16. Separation of bioactive compounds - TLC or Column Chromatography.
17. Immobilization of cells and enzymes.
18. Antibiotic sensitivity test: a) Kirby Bauer's method and b) MIC determination by filterpaper assay and broth dilution assay



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## 22SCCMB6P - Food Microbiology and Industrial Microbiology- MAPPING

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3
CO2	3	1	2	2	3
CO3	2	2	2	2	3
CO4	2	2	1	2	2
CO5	2	2	2	2	2
Optimum Point	3	2	2	2	3

  
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## MAJOR BASED ELECTIVE II

### RECOMBINANT DNA TECHNOLOGY

#### COURSE OBJECTIVES:

- To educate the learners with the fundamental knowledge and importance of recombinant DNA (rDNA) technology.
- To learn gene isolation techniques.
- To describe the jargons of genetic engineering/ rDNA technology.
- To learn the basic tools, techniques and methods employed in gene cloning and gene expression strategies.
- To study the genetically engineered products in our daily life.

#### UNIT – I Milestones in rDNA Technology:

Milestones in rDNA technology - Definition of gene manipulation - Major steps involved in gene cloning - Isolation and Purification of Chromosomal and Plasmid DNA, Isolation and Purification of RNA - Chemical Synthesis of DNA, Genomic Library and cDNA Library - applications.

#### UNIT – II Enzymes of rDNA Technology:

Restriction endonucleases: Discovery, Type I, II and III and Mode of action, Applications of type II restriction endonucleases, Ligases, DNA polymerases, DNA modifying enzymes and topoisomerases.

#### UNIT – III Cloning Vectors: Cloning vectors:

Definition and properties – Plasmid based vectors: Natural vectors (pSC101, pSF2124, pMB1), Artificial vectors (pBR322 and pUC) - Phage based vectors- λ) Lamda) phage vectors and its derivatives - Hybrid Vectors Phagemid and Cosmid, BAC and YAC – Expression systems – E. coli.

#### UNIT – IV Gene/ DNA Transfer Techniques:

Gene/ DNA transfer techniques: Physical – Biolistic Method (Gene gun), Electroporation, Microinjection. Chemical- Calcium chloride and DEAE Methods, Biological in vitro packaging method in viruses - Selection and Screening of recombinants: Direct Method: Selection by Complementation, Marker inactivation methods - Indirect methods: Immunological and Genetic methods.



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## UNIT – V Nucleic Acid and Protein Hybridization Techniques:

Blotting (Southern, Western, Northern and North- eastern) techniques – PCR - basic steps in DNA amplification, RAPD, RFLP and their applications – DNA finger printing - DNA microarray analysis – Applications of recombinant DNA technology.

## UNIT – VI Current Contours (for continuous internal assessment only):

Students may source recent advancements of recombinant DNA technology medicine and agriculture - human recombinant insulin, growth hormone, and blood clotting factors, recombinant COVID-19 Vaccines, golden rice, herbicide-resistant crops, and insect-resistant crops from internet, social media and others.

### 22SMBEMB2A- Recombinant DNA Technology - Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	1	1
CO2	2	2	2	2	2
CO3	3	3	3	2	2
CO4	2	3	3	3	2
CO5	2	2	2	2	2
Optimum Point	3	3	3	2	2

  
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## MAJOR BASED ELECTIVE II

### 2. MICROBIAL BIOTECHNOLOGY AND BIOETHICS

#### COURSE OBJECTIVES:

- To introduce the role of micro-organisms in biotechnology.
- To understand various metabolic processes involved.
- To provide the first- line knowledge of utilizing microbes for the industrial production.
- To create awareness on the roles of microbes in the biotechnology field.
- To gather a sound knowledge of genetic manipulation as to attribute desirable characteristics.

#### UNIT – I Microbial Production of Therapeutic Agents and Vaccines:

Biotechnology: Definition – Milestones in History - Scope of microbial biotechnology and its applications - Microbial production of pharmaceuticals – antibiotics, hormones (insulin), enzymes (streptokinase), recombinant vaccines (Hepatitis B vaccine) - Edible vaccine, Monoclonal antibodies.

#### UNIT - II Production of Biofertilizer, Biopesticides, Bioplastics and Bioremediation:

Microbial production of biofertilizers – (Rhizobia, Azospirillum, Frankia and VAM). Microbial production of bio-pesticides (Bacillus thuriangiensis). Microbial production of bioplastics. Microorganisms in bioremediation: Degradation of xenobiotics.

#### UNIT – III Algal Biotechnology:

Single cell protein (algae and yeast). Microalgal technology – Industrial cultivation methods of Spirulina – biotechnological potentials of Spirulina as: food and feed – fuel production from microalgae – pharmaceutically valuable compounds from microalgae. Commercial production of bio-ethanol and bio-diesel using lignocellulosic waste.

#### UNIT – IV Genetic Engineering of Plants and Animals:

Genetic engineering of plants: Ti plasmid vectors and gene transfer in plants – Development of insect, virus and herbicide resistant plants. Transgenic animals: methods of creating transgenic mice and sheep. Human gene therapy – in vivo and ex vivo gene therapy.

#### UNIT – V IPR and Bioethics:

Intellectual Property Rights (IPR) - different types of IPRs - Principles of Bioethics (IB) - Definition of Ethics and Bioethics. - Ethics committee - Brief account on risks and ethics of modern biotechnology - Ethical concerns in human gene therapy – Ethical limits of animal use. Ethical issues at the beginning of life (abortion) – Ethical issues at the end of life (withholding and withdrawing medical treatment and euthanasia).



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UNIT – VI Current Contours (for continuous internal assessment only):

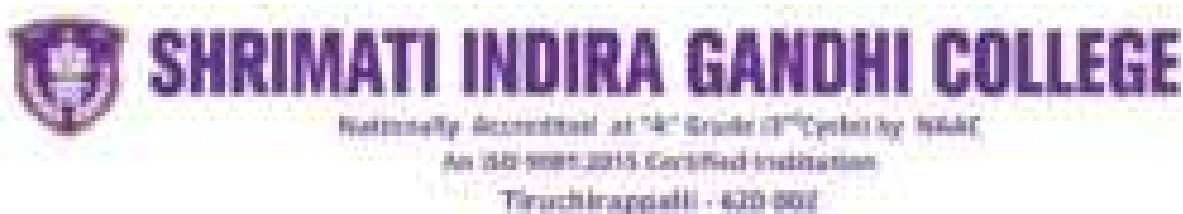
Learners can visit nearby agricultural field (Rice, onion, cotton or any other) to enrich knowledge on the application of biofertilizers. Students may prepare posters and models on Biogas, biofuel, Organic farming, Panchagavya, dolly, knockout mice, double transgenic mouse.

## 22SMBEMB2B- Microbial Biotechnology And Bioethics -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	1
CO2	2	2	2	2	1
CO3	3	3	3	2	1
CO4	2	2	2	2	1
CO5	2	2	2	2	1
Optimum Point	3	3	3	3	1

  
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## SKILL BASED ELECTIVE II BIOFERTILIZER TECHNOLOGY

### COURSE OBJECTIVES:

- To introduce the necessity and application relevance of biofertilizers.
- To initiate the students towards the development of sustainable agriculture.
- To learn how biofertilizers can be produced in large scale level.
- To signify the microbial biofertilizers namely, bacteria, fungi, cyanobacteria and actinorhiza.
- To present various methods of applying biomanures in the current agriculture.

### UNIT - I Origin of Fertilizers and Natural Cycle:

Introduction - History, importance and present status of different types of fertilizers and their application to crop plants. Importance of macro and micro nutrients. Biological fixation of nitrogen; Natural cycles associated with microorganisms - carbon, nitrogen, phosphorous and sulphur.

### UNIT – II Cyanobacterial and Bacterial Biofertilizers:

Cyanobacterial Biofertilizers - Nostoc, Anabaena, Gloeocapsa and Scytonema as biofertilizers; Symbiotic association with Azolla; Multiplication of blue green algae and its effect on rice yields. Bacterial biofertilizers - Free living forms: Azotobacter, Azospirillum; Symbiotic forms: Rhizobium - Legume Association; Pseudomonas, Non-legume association.

### UNIT – III Fungal and Actinobacterial Biofertilizers:

Fungal biofertilizers – Types of fungal biofertilizers, ectomycorrhizal association with pines; arbuscular mycorrhizal association - Glomus sp., actinomycetes as Biofertilizers – Actinorhiza, Actinorhizal associations - Frankia sp.

### UNIT - IV Biomanure Production:

Biomanures - A general account of manures – Moulds; Composts Farm Yard Manure- Oil seed cakes - Castor and neem; Green leaf manures - Gyricidia, Sesbania and Crotalaria; Agro-industrial wastes - Poultry manure and saw-dust; Vermi Compost; Microbial compost - pure culture techniques, consortium – types of compost pits. Biodegradation of organic components.



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UNIT – V Mass Production of Biofertilizers:

Production of Rhizobium, mycorrhiza. Synthesis of micro and macro nutrients. Application of biofertilizers and manures - A combination of biofertilizer and manure applications with reference to soil, seed and leaf sprays. Laboratory and field application; Cost analysis of biofertilizer and biomanure production.

UNIT – VI Current Contours (For continuous internal assessment only):

Field trip to the institutes related to biofertilizers and biomanure production. Analysis of microbiological quality in fertile and infertile soil. An awareness to the farmers about the importance of the biofertilizers.

## 22SSBEMB2 - Biofertilizer Technology -Mapping

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	2	1
CO2	3	3	3	3	2
CO3	3	3	3	3	2
CO4	2	3	2	2	2
CO5	2	3	2	2	2
Optimum Point	3	3	3	3	2

  
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## PROGRAMME OUTCOMES:

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## **PROGRAMME-SPECIFIC OUTCOMES:**

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills
- Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served.

**First Year**

**CORE COURSE-I  
INTRODUCTION TO SOCIAL  
WORK AND SOCIETY**

**Semester-I**

**Code:**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES**

- To develop an insight into the historical context of origin and development of social work profession.
- To impart social and religious ideologies of India for ensuring change.
- To cultivate an understanding of the theoretical framework of the subject.
- To imbibe an idea about the social structure and social problems.
- To infuse a philosophical foundation and value base of social work profession.

**UNIT- I:**

**Social Work: Concepts-** Social Work, Social Service, Social welfare, Social Security, Social Defense, Social Justice, Social Development, and Social Reform and Historical development of Social Work in UK, USA, and India. Socio-religious thoughts of India: Hinduism – four values, Buddhism, Jainism, Sikhism, Christianity- Supreme value of man, concept of love and service, and Christian missions; Islamism: Basic beliefs, values; Islamic religion and cultural system; Social Reform movements in India- its impacts and role of Brahma Samaj, AriyaSamaj, PrarthanaSamaj, Ramakrishna mission, Theosophical society, Bakthi movements, and D.K. Movement.

**UNIT- II:**

**Individual & Society:** Meaning and Characteristics of Society, Community, Association, Organization and Social Institutions- Culture and Civilization- Socialization and its agencies-Social Structure and Social Stratification-Caste System and Class System - Social Groups - Social Change- Theories and Factors of Social Change, Westernization and Modernization and Post Modernism - Social Disorganization and Social Deviance- Social Control: Kinds, Values, Norms, Folkways, Mores and Laws - Relevance of Sociology for Social Workers.

**UNIT- III:**

**Social Work as a Profession:** Nature and scope, objectives; philosophy and principles, functions, values and ethics. Social work education: as a profession, professional values, training; skills, tools and techniques, professional social work and voluntary social work, professional associations in social work; problems faced by social work professionals in India.

**UNIT- IV:**

**Methods of Social Work:** Social case work – social group work – community organisation – social work research – social welfare administration – social action. Fields of social work: family and child welfare, women welfare, youth welfare, community development (rural, urban & tribal), medical and psychiatric social work, correctional social work, Geriatric Social Work, Work place social Work and labour welfare.

## UNIT –V:

**Theories & Approaches (basic/overview only):** Role theory, problem-solving theory, and gestalt theory. systems theory, ecological theory, communication theory, existential approach, Indian perspective of social work, feminist approach; relevance and scope of eclectic/integrated approach to social work practice, role of social worker in remedial, preventive, and developmental models and as an instrument of change and development; modern Indian social thoughts of Ambedkar, EVR Periyar, Swami Vivekananda, DeendayalUpadhyaya, Aurobindo, Tagore, Mahatma Gandhi, and SavitribaiPhule

## UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :

Students are expected to read and know the recent trends in social work and its reform movements and the application of social work in new areas.

## REFERENCES

1. Albrecht, Gary L. Encyclopedia of Disability (4 Volumes), Sage, Oaks. 2006
1. Banks, Sara (1995) Ethics and Values in Social Work: Practical Social Work Series, Macmillan, London.
2. Bhushan, Vidya&Sachdeva, D.R. An Introduction to sociology, Kitalmahal, Allahabad. 1995
3. Chowdhry, Dharam Paul. Introduction to Social Work: History, Concept, Methods, and Fields. Atma Ram, 1964.
4. Congress, E.P. Social Work Values and Ethics, Nelson-Hall, Chicago, 1998
5. Desai, M. Curriculum Development on History of Ideologies for Social Change and Social Work, TISS, Mumbai. 2000
6. Fink A.E. The fields of social work, Henry Hold, New York. 1974.
7. Fried Lander, A.W. Introduction to social work, Prentice Hall, New Jersey, 1974
8. Gangrade, K.D. Dimensions of Social Work in India, Marwah, New Delhi, 1976
9. Hans Nappaul. The study of Indian Society. S.Chand& Co, 1972.
10. Jacob K.K. Social Work Education in India (ed), Himanshupub. New Delhi. 1994
11. Jacob, K. K. Social Work Education in India:(retrospect and Prospect). Himanshu Publications, 1994.
12. Kinduha, S.K. Social work in India, SarvodayaSahityaSamaj, Rajasthan, 1965
13. Payne, Malcom. Modern Social Work Theory: a critical introduction, Macmillan, Hound mills, 1991.
14. Singh, R.R. Field Work in social work education (Ed), Concept pub., New Delhi. 1985.
15. Srinivas, Mysore Narasimhachar. "Caste in modern India and other essays." Caste in modern India and other essays. 1962.

## COURSE OUTCOMES : Upon successful completion of this course, the student should be able to

- Identify the basic elements of social work profession
- Define the socio-religious ideologies, values and ethics of social work
- Distinguish between social work and social service
- Hold knowledge of sociology for social workers
- Compare and contrast social work profession



PO & PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	2	1	3	2	3	1
CO2	2	2	1	3	2	3	1
CO3	2	2	1	2	3	3	1
CO4	3	2	1	3	3	3	1
CO5	2	2	1	2	3	2	1
Optimum Average	3	2	1	3	3	3	1

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
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- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

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- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
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- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**First Year**

**CORE COURSE-II  
SOCIAL CASE WORK AND GROUP  
WORK  
(Theory)**

**Semester-I**

**Code:**

**Credit: 5**

**OBJECTIVES:**

- To understand case work and group work methods in Social Work and to understand values and principles of working with individuals and groups.
- To develop the ability to critically analyse problems of individuals and families and factors affecting them.
- Develop appropriate skills and attitudes to work with individuals and groups.

**UNIT –I:**

**Case Work:** Concepts, objectives/purpose/its importance; nature and scope, historical development; components; values and principles of case work practice; **Case work process:** Intake, Study, Assessment, Diagnosis, Treatment/Intervention techniques (supportive/environmental manipulation, reflective/ practical help or material help & direct treatment/counselling). **Evaluation:** meaning, purpose/objectives, types, methods/techniques/instruments, **Termination:** meaning, reaction to termination, decision to terminate, and planning for termination. **Follow-up-** meaning, purpose, and types.

**UNIT-II:.**

**Case Worker-Client Relationship:** meaning, purpose/needs/significance, and elements/components; principles of client-worker relationship; obstacles in client-worker relationship. **Case Work and Communication:** meaning, purpose, importance, principles. **Approaches to Practice:** psychosocial, problem-solving, crisis intervention; behaviour modification, functional and development of an eclectic model for practice.

**UNIT–III:**

**Recording in Case Work:** meaning, sources and types- principles of recording, use, and maintenance of record. **Application of Social Case Work in different settings:** medical and psychiatric settings-mentally retarded shelter homes; mental rehabilitation centres, de-addiction and detoxification centres, mental health & community-based rehabilitation; **Problems and Limitations and Role** of case worker in various settings; professional self; conflict and dilemmas in working with individuals and family.

**UNIT –IV:**

**Social group:** definition, characteristics, types of groups-social group and social group work group; and functions of a group; Group process; **Group dynamics**-meaning, definition, functions, and basic assumptions of group dynamics. **Social group work:** concepts-assumptions, purpose, goals, principles, and values of group work, and historical development of group work; group work as a method of social

work and its relation to other methods of social work. **b. Group work process:** Intake and study: Assessment-Intervention/treatment- Evaluation;

#### **UNIT –V:**

**Models and approaches:** social goal model, remedial and reciprocal model; group therapy/group psychotherapy/ therapeutic /social treatment, development group and task-oriented group, etc. b. Group work recording: meaning, purpose, types and principles of group work recording, scope, problems, and limitations of group work practice in Indian settings; role of group worker in various settings.

#### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Self-Study: Training the Postmodern social case work and social group work.

#### **REFERENCES:**

1. Jordan, William. *Client-worker transactions*. Routledge& K. Paul, 1970.
2. Kadushin, Goldie. *The social work interview: A guide for human service professionals*. Columbia University Press, 2012.
3. Mathew, Grace. *An introduction to social casework*. Tata Institute of Social Sciences, 1992.
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5. *Research and practice*. Vol. 14. SAGE Publications, Incorporated, 1990.
6. Tilbury, Derek EF. *Casework in context: a basis for practice*. Elsevier, 2014.
7. Timms, Noel. *Recording in social work*. Taylor & Francis, 1972.
8. Alissi, Albert S. "Social group work: Commitments and perspectives. "*Perspectives on social group work practice* (1980): 5-35.
9. Conyne, R. K. (1999). *Failures in group work: How we can learn from our mistakes*. Chronicle Books.
10. Corey, Gerald. *Theory and practice of counseling and psychotherapy*. Nelson Education, 2015.
11. Douglas, Tom. *Group processes in social work: a theoretical synthesis*. John Wiley & Sons, 1979.
12. Glassman, Urania. *Group Work: A Humanistic and Skills Building Approach: A Humanistic and Skills Building Approach*. Vol. 13. SAGE Publications, 2008.
13. Konopka, Gisela. *Social group work: A helping process*. Prentice-Hall, 1972.
14. Nicolson, Paula, Rowan Bayne, and Jenny Owen. *Applied psychology for social workers*. Palgrave Macmillan, 2006.

#### **E-BOOKS /E-MATERIALS:**

1. <https://mpbou.edu.in/news1m/pgc/msw2p2.pdf>
2. [https://www.bdu.ac.in/schools/socialsciences/socialwork/docs/studymaterials/Social\\_Case\\_Work\\_Practice\\_Working\\_with\\_Individuals\\_unit\\_1.pdf](https://www.bdu.ac.in/schools/socialsciences/socialwork/docs/studymaterials/Social_Case_Work_Practice_Working_with_Individuals_unit_1.pdf)
3. [http://www.uop.edu.pk/ocontents/5%20\(b\)%20Social%20Structure%20of%20the%20Group%20\(pg%2028-36\).pdf](http://www.uop.edu.pk/ocontents/5%20(b)%20Social%20Structure%20of%20the%20Group%20(pg%2028-36).pdf)

**COURSE OUTCOME:**

- To understand the values, Principles and scope of Social Case Work and Social Group Work to develop the capacity to practice them
- To understand and apply the approaches & models of Case Work / Group work practice in different settings
- To develop an understanding of and an ability to adopt a multi-dimensional approach in assessment and interventions

PO \ CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	2	1	3	2	3	1
CO2	2	2	1	3	2	3	1
CO3	2	2	1	3	2	3	1
Average	2	2	1	3	2	3	1

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

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## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

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- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served



**First Year**

**CORE COURSE-III  
FIELDWORK PRACTICE**

**Semester-I**

**Code:**

**(FIELDWORK)**

**Credit: 5**

**COURSE OBJECTIVES**

- To get exposure to different social issues and to different social work settings.
- To get acquainted with the Origin, Administrative structure, functioning, staffing pattern, and organisation activities.
- To make use of supervision & guidance in understanding social issues.
- To make the social work trainees experience group living and initiate and participate in development work in a village identified by the department and the students.
- To expose the social work trainees to rural/tribal life and living.
- To enable the social work trainees to learn by carrying out development projects after identifying local needs.
- To expose and involves social work trainees in small groups working intensively on a relevant social issue with study and action components to highlight the issue and to take appropriate action possible given the time and resources within their command.
- To help social work trainees to develop capacities and attitudes suitable for group living.
- To inculcate the spirit of working in a team and document the outcome of visits.

**INTRODUCTION**

Social work practice is designed to provide a variety of opportunities to develop and enhance professional practice skills through three components, namely orientation/ observational visits, rural/tribal camps, and Group Projects in the first semester.

**COMPONENT NO.I**

**OBSERVATION VISITS TO DIFFERENT FIELDS OF SOCIAL WORK.**

**Orientation/ Observation Visits:** A detailed instruction about fieldwork, objectives importance of fieldwork. Orientation provides information regarding (1) the importance and place of the practice in social work education and (2) the purpose, functions, and ethics in professional practice. The purpose of the observation visits is to acquire skills of systematic observation and to develop a spirit of inquiry; to understand society's response to social problems through various services, understand and appreciate, to develop the ability to evaluate the initiative of voluntary and government programmes critically, and to develop an appreciation of social work intervention in these programmes.

No. of visits:10      Duration: 10 Days

**PROCESS**

The social work trainees, accompanied by a faculty member, shall visit pre-identified agencies in different areas like disability, health, aged, children, women, and slums, rural & urban and industrial communities. The students are expected to observe & enquire about

1. Background and field of work of the agency.
2. Place and role of the agency in society.
3. Aims, objectives and programmes implemented.
4. Types of Beneficiaries / Target groups.
5. Administrative structure, departmentalization, staffing pattern.
6. Funding and resource mobilization.
7. Problems and issues faced by the organization.
8. Conditions and problems of the inmates /beneficiaries,

During their observation visits, and document the same. The learning and outcome of each visit is to be evaluated through a group conference under the supervision of a faculty member.

### **MANDATORY REQUIREMENTS**

1. Social work trainees should submit an observation visit report to the concerned faculty supervisor on the very next day of each visit.
2. Geo-tag photos need to be enclosed.

### **SKILLS TO BE DEVELOPED BY THE SOCIAL WORK TRAINEES**

1. Observation/learning skills;
2. Communication/presentation skills;
3. Interpersonal skills;
4. Documentation skills.

### **COMPONENT NO.II**

#### **RURAL/ TRIBAL CAMP**

**DURATION: Pre-camp Preparation- 6 field work days + on camp: 7 days.**

The actual rural/tribal camp is preceded by two weeks of camp preparation to actual camp. This will include pilot visits to the village (s) for identification of the camp site, projects to be implemented, and liaising with the local community, various NGO's and Government departments to conduct the rural camp in a particular place.

#### **PROCESS**

The entire class shall be divided into various committees: Programme Committee, Cultural Committee, Food Committee, Public Relations Committee, Travel and Accommodation Committee, Finance Committee and Time keeper. All the social work trainees will elect A Social work trainees' coordinators and members. For overall coordination, two student camp leaders will also be elected.

Faculty members as camp coordinators will guide and facilitate the working of the committees. Thus the whole class will plan and execute the tribal/rural camp by working out the logistics, contributing and mobilizing necessary resources for the conduct of the camp.

The whole process will be documented and evaluated by the class in terms of camp experience, outcome and learning with reference to the objectives specified.

## **MANDATORY REQUIREMENTS FOR RURAL CAMP**

### **PILOT VISIT**

For finalizing the rural campsite, a preliminary visit shall be undertaken to villages or other suitable rural areas in and around the local district. The team visiting shall consist of at least two faculty members and one social work trainee- representatives from each committee (10 students). The team shall undertake at least one such visit to (i) understand the learning objectives (ii) find out the feasibility of conducting the camp in terms of infrastructure facilities (accommodation, water, toilets, electricity etc), support systems, resources (people and material resources) and scope for effective social work intervention. A convenient vehicle can be hired for this purpose.

### **PRE-CAMP:**

Each committee is expected to present their overall Schedule along with the budget and invitation of the camp planning in the presence of Faculty members and senior students for their comments and suggestions.

### **POST CAMP:**

Each committee is expected to present their Expenditure, Press clippings, and Programme execution reports in the presence of Faculty members and senior students. A consolidated report has to be submitted to the department within the Month

## **COMPONENT NO.III**

### **GROUP AWARENESS PROJECT**

Group Awareness Project on social issues/problems – a minimum of 12 days to be allotted for this purpose. Each group is to be organized with a minimum of two programmes. Each group should comprise three to five students. One programme should be rural-based. Suggested themes such as anti-dowry campaigns, HIV/AIDS Awareness, Gender sensitization, Alcoholism, Drug Awareness, Mental Health, Environment, Waste management, Human rights etc., can be considered.

### **DURATION:**

12 Field Work days.

### **PROCESS:**

1. In this component, the social work trainees will be divided into small groups based on their rural/tribal camp performance. In turn, the team will be chosen by the faculties through a lottery method.
2. The Social work trainees will be given an opportunity to learn community interaction and presentation skills
3. The Social work trainees thereafter (during the next two weeks of the project field work period) will be put under the supervision of an internal faculty supervisor. Under the guidance and supervision of the faculty supervisor, the project team should design a suitable programme to spread a social message of their choice in the community setting.

4. The social work trainees should prepare the Reports, presentations and Documentation of the project undertaken.

### **MANDATORY REQUIREMENTS**

1. The title of each group should be reflecting social concern.
2. The Social work trainees are expected to acquire knowledge on the topic chosen.
3. A minimum of two programmes should be conducted (Urban and Rural).
4. The Programmes should have collaborated with local stakeholders.
5. Acknowledgement/Appreciation Letter/Feedback should be collected from the collaborated NGO/Institution/Industry/Local Panchayath Leaders.
6. Consolidated report consisting of Review of Literature, Invitation, Geo Tag photos, Press Clippings and participant list

### **EVALUATION: TOTAL MARKS – 100**

#### **INTERNAL EVALUATION- 40 MARKS**

##### **A. FILED ORIENTATION VISITS (10MARKS)**

- |                                 |             |
|---------------------------------|-------------|
| (i) Observational Skills        | - 3.5 marks |
| (ii) Reporting                  | - 3.5 marks |
| (iii) Attendance for field work | - 3 marks   |
|                                 | -----       |
|                                 | 10 marks    |

##### **B. RURAL / TRIBAL CAMP (15 MARKS)**

- |                                |           |
|--------------------------------|-----------|
| (i) Individual Participation   | - 5 marks |
| (ii) Initiative and Leadership | - 5 marks |
| (iii) Community Involvement    | - 5 marks |
|                                | -----     |
|                                | 15 marks  |

##### **C. GROUP AWARENESS PROJECT (15 MARKS)**

- |                                    |           |
|------------------------------------|-----------|
| (i) Organising Ability & Team Work | - 5 marks |
| (ii) Resource Mobilisation         | - 5 marks |
| (iii) Social Relevance             | - 5 marks |
|                                    | -----     |
|                                    | 15 marks  |

#### **EXTERNAL EVALUATION – (60 MARKS)**

External examiner to be appointed by the University as is for a project. One examiner may be appointed for every 15 students.

Break up of marks is as follows:

1. Theoretical Knowledge	- 15 marks
2. Practice Skills	- 15 marks
3. Mobilising Resources	- 10 marks
4. Communication and Presentation	- 10 marks
5. Reporting	- 10 marks
	-----
	60 marks

## **COURSE OUTCOME**

After successfully completing this course, the Social Work trainees will be able to learn, re-learn and enhance Basic skills necessary for social work practice, such as

- Community interaction skills,
- Communication skills,
- Presentation skills,
- Analytical skills,
- Team work,
- Project planning and implementation;
- Leadership, initiative and motivation
- Coordination and cooperation
- Identification and mobilization of resources
- Implementation and evaluation
- Public relations and Liaison; Documentation and presentation.

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	2	1	3	2	3	1
CO2	2	2	1	3	2	3	1
CO3	2	2	1	3	2	3	1
CO4	2	2	1	3	2	3	1
CO5	2	2	1	3	2	3	1
CO6	2	2	1	3	2	3	1
CO7	2	2	1	3	2	3	1
CO8	2	2	1	3	2	3	1
CO9	2	2	1	3	2	3	1
CO9	2	2	1	3	2	3	1
CO10	2	2	1	3	2	3	1
CO11	2	2	1	3	2	3	1
Average	2	2	1	3	2	3	1

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
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**First Year**

**CORE CHOICE COURSE-I**  
**1.DEVELOPMENT PSYCHOLOGY**  
**(Theory)**

**Semester-I**

**Code:**

**Credit: 4**

**COURSE OBJECTIVES**

- To teach the students the relevance of psychology and its application in the fields of Development psychology.
- To help them to know the developmental stages of life span as a product of social, psychological and biological factors.
- To enable the students to know the physical, social, emotional, and mental aspects of human development

**UNIT – I:**

Human Growth and Development: Nature of Development psychology, scope, objectives, uses. Growth: Meaning, Types of Developmental changes, Principles of Human Growth, factors affecting human Growth, Heredity, Environment and Maturation.

**UNIT – II:**

Prenatal Development and Birth: From conception to birth, Environmental influences on prenatal Development, Stages of psychosocial development, Types of delivery, The physical self. Infancy, Infant Perception and Cognition, Physical, Social, Mental and Emotional Development In Infancy.

**UNIT – III:**

Babyhood and Childhood: Physical, Motor, Social, Mental and Emotional Development during this stage, Sex Differences and Sex-Role Development, parental variables as factors, personality Development of babyhood and childhood

**UNIT – IV:**

Puberty and Adolescence: Meaning and Definition, Changes in reproductive organs, Physiological, Social, Mental, Personality and Emotional Development during this stage, Sexual maturity, Impact of general development and attitude.

**UNIT-V:**

Adulthood, middle age and old age: Development and problems in this stage, Social expectation, major life hazards, Physical, Psychological Emotional, economic and vocational challenges. Empty nest.

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only) ::**

Topics for Self-Study (Not for Evaluation):

Each student should study the personality Development of each stage with suitable cases studies from their field work experiences. (<https://www.nlpacademy.co.uk>)

## **TEXT BOOKS:**

1. S.KMangal(2009) General Psychology, Sterling Publishers Private Limited, New Delhi (Unit I, III, IV & V)
2. Hurlock E.B.(1981) Developmental Psychology, Tata McGraw Hill, New Delhi. (Unit II)

## **REFERENCE BOOK:**

- 1 Anastasi, A : Psychological testing, New York: Macmillan Revised Edition 1987.
- 2 Chaude, S.P: Developmental Psychology, New Delhi, Neelkamal Publications Pvt Ltd, 2003
- 3 David R. Shaffer: Developmental Psychology-Childhood and Adolescence, New York, Brook/Cole Publishing Company, 1996.
- 4 Davidoff, L.L.: Introduction to Psychology, Auckland; McGraw Hill Inc; 1981
- 5 CSSR: A survey of research in psychology chapter 2, developmental psychology, Bombay; Popular Prakashan pp.56-79; 1972.
- Ernest R. Hilgard et al., Introduction to Psychology, New Delhi, Oxford & IBH Publishing Co Pvt, 1975
- 6 Kuppusamy B.: An Introduction to social psychology; Bombay; Media Promoters and pub. Pvt. Ltd., 1980.
- 7 Morgan, C.T. & King, R.A.: Introduction to psychology New York
- 8 Munn, N.A.: Psychology-The fundamentals of human behaviour; London; George G. Harrap & Co, Ltd., 1961
- 9 Rayner, Eric: Human Development, London; George Allen and Unwin, 1978
- 10 Saraswathi T.S, Dutta R : Development Psychology in India, Delhi; Sage publications, 1987.

**COURSE OUTCOME** After successful completion of this course, the students will be able to:

- Explore the developmental stages of life span as a product of social, psychological and biological factors
- Construct strategies by applying the psychological concepts, to enhance human development
- Detect the factors influencing personality Development on different stages.

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1
CO1	2	2	1	3	2	3	1	3
CO2	2	2	1	3	2	3	1	3
CO3	2	2	1	3	2	3	1	3
Average	2	2	1	3	2	3	1	3

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
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- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

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- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
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**First Year**

**ELECTIVE COURSE-I**

**Semester-I**

**2. SOCIAL WORK WITH PERSONS  
WITH DISABILITY**

**Code:**

**(Theory)**

**Credit: 3**

**COURSE OBJECTIVES**

- To teach the student about the strategies, therapies and assistive devices for helping the disabled.
- To enable the students to know the need for education, types and models for the disability.
- To familiarize the students with the various Laws, welfare, and rehabilitation services for the disabled.

**UNIT- I:**

Introduction to Disability: Definitions-, Disability, Impairment, Handicap, Magnitude, Causes and Consequences of Disability. Disability as a social construct: Attitudes, Stigma, Discrimination faced by people with disability. Myth and misconception of Disability. Different approaches to disability.

**UNIT- II:**

Classification of Disability: Different Types of disability -Visual Impairment, Hearing Impairment, Locomotor Disability: Intellectual disability/mental retardation -Cerebral Palsy, Multiple Sclerosis, Autism -magnitude, causes, types, assessment, impact on child's development and adult.

Psycho-social problems of persons with disability: magnitude, causes, types, assessment, impact on child's development and adults

**UNIT -III:**

Problems of Persons with Disability: Health problems including physical, mental, reproductive and sexuality. Psychology of disability, adjusting to one's own disability, self-esteem, resilience and coping mechanism of individual. Role of Social Worker in rehabilitation of Person with Disability and as a vital member of Multidisciplinary rehabilitation team.

**UNIT- IV:**

Education and Employment for Disabled: Special education and integrated Education: Definition, need and importance. Difference between integrated and inclusive education. Work disability management. Scheme of integrated education for disabled children (IEDC).

**UNIT-V:**

Rights and Entitlements Of The Disabled: Fundamental Rights and constitutional rights of the Disabled, Mental health act 1987, The rehabilitation council of India Act (RCT) 1992, The Persons with Disability Act 1995 (PWD), National Institutes: District Rehabilitation Centre, District disability rehabilitation centres, Composite regional centre (CRCs), Regional rehabilitation centre (RRCs)

## **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Self-study: Ableism: Examine the social construction of disability from different stakeholder perspectives.

### **REFERENCES:**

1. Singh J.P Dr. and Manoj K. Dash Dr. disability development in India .RCI, Kanishka, Pub, New Delhi, 2005
2. Dr. Jose Murickan S.J, Dr. Georgekutty Kareparampil: Person with disabilities in society, Kerala federation of the blind, 1995
3. Mohapatara C.S Disability management in India, challenges and commitment, NIHM and Indian institute of public administration, 2004
4. James E. Yassedyke, Bob Algozzine, Martha Thyrlow: Critical Issues in special education, Kanishka Pub, New Delhi.
5. Bhanushali Kishorkumar D, Rehabilitation of Persons with Disabilities,
6. Mani M.N.G Inclusive foundation –In Indian Context, Sri Ramakrishna Mission Vidyalaya, Coimbatore, 2000.
7. Text book for BED special education, MPBHOJ University, Bhopal.

### **E-BOOKS/E-MATERIALS:**

<https://www.kobo.com/us/en/ebook/social-work-with-disabled-people-1>  
<https://www.wiley.com/en-us/Social+Work+and+Disability-p-9780745670195>  
<https://disabilityaffairs.gov.in/content/>  
<https://social.un.org/publications/UN-Flagship-Report-Disability-Final.pdf>

### **COURSE OUTCOMES:**

- To understand the conceptual differences between the terms ‘impairment’, ‘disability’ ‘handicap’ and ‘challenged’ and understand the concept of classification and labelling
- To analyze the factors that influence the prevalence of disabilities
- To develop knowledge about the various disabling conditions associated with the challenged. CO4: To understand the social work intervention mechanisms for the challenged
- To formulate intervention strategies while working with the challenged.

PO \ CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	2	1	3	2	3	1
CO2	2	2	1	3	2	3	1
CO3	2	2	1	3	2	3	1
CO4	2	2	1	3	2	3	1
Average	2	2	1	3	2	3	1

K1= Low, K2= Moderate, K3= Substantial



### PROGRAMME OUTCOMES:

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
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evaluate practice with individuals, families, groups, organisations and communities.

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- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

### **PROGRAMME-SPECIFIC OUTCOMES:**

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- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
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**First Year**

**VALUE ADDED COURSE-I  
FAMILY LIFE MANAGEMENT**

**Semester-I**

**Code:**

**(Theory)**

**Credit: 2**

### **COURSE OBJECTIVES**

- To introduce the students the Family Dynamics.
- To familiarize the students with the Philosophy, Values, Standards, and Goals of Family.
- To teach the students about decision-making in Family Living
- To train the students in the management of Family Resources.
- To enlighten the students on social action and social work research as indirect methods of social work

#### **UNIT -I:**

Family Dynamics Meaning; Family Life in a Changing World; Role of Family; Role of Family members; Role of Women; Family Life Cycle: Stages; The home in an industrial Context; Concept of Management in the Home; Managerial Responsibilities.

#### **UNIT -II:**

Philosophy, Values, Standards and Goals Development of a Philosophy; The concept of Value; Values and Attitudes; Development of Family Value Patterns; The concept of Standards; The concept of Goals; Customary beliefs.

#### **UNIT- III:**

Decision Making in Family Living, Steps in Decision-Making Process; Kinds of decisions families make; The concept of Family Resources; The management Process.

#### **UNIT- IV:**

Management of Family Resources: Time Management; Energy Management; Work Simplification; The process of Family Finance Management: The concept of Income Management; Analysis of Kinds

of Income; Guidelines in money income management; Borrowing: the family's use of credit; Conflict Management in Families.

#### **UNIT -V:**

The Family's Plans for the Future Institutions Savings, Investments and the Estate: Institutions for Family Savings; Taxation in Family Plans; Planning the Family Estate; Insurance for the Family.

#### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only) ::**

Students are expected to prepare a profile of the management of a family of their own or relatives with regard to their family dynamics, Philosophy, values, standards and goals, decision- making, management of family resources and saving habits in the family.

#### **REFERENCES:**

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16. Steidl and Bratton.( 1967). Work in the Home, John Wiley and Sons. New York.
17. Pedagogy: Chalk &talk, e -content, PPT, Group Discussions, Videos, Quiz & Assignments

#### **COURSE OUTCOME**

- On successful completion of the course the students will be able to
- Recall Family Dynamics

- Understand Philosophy, Values, Standards and Goals of Family
- Examine Decision-making in Family
- Discover Kinds of Family Resources
- Plan for the future of the Family.

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	3	3	3	1	1
CO2	2	3	3	3	2	1
CO3	1	2	3	3	1	2
CO4	3	3	3	3	2	1
CO5	3	3	3	3	1	1
CO6	3	3	3	3	1	1
Optimum point	3	3	3	3	1	1

K1= Low, K2= Moderate, K3= Substantial



### PROGRAMME OUTCOMES:

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills,

advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.

- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**First Year**

**CORE COURSE-IV  
COMMUNITY ORGANISATION &  
SOCIAL ACTION**

**Semester-II**

**Code:**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES:**

- To understand the different aspects of a community, its functions, and problems
- To understand the critical elements of community organisation process
- To enhance the critical understanding of models and strategies for CO
- To develop attitudes conducive to participatory activities for a civil society
- To gain knowledge on the various techniques and skills of community organisation & social action and to develop the basic skills to apply for those in the community.

**UNIT-I:**

Community: meaning, types, and characteristics; community power structure minority groups; Community Dynamics: integrative and disintegrative processes in the community. Leadership: definitions, types and qualities; leadership in different types of communities, theories of leadership. Community power structure and factions and sub-groups; minority groups. Concept of community development - Similarities and differences between Community Organization and community development.

**UNIT-II:**

Community Organisation: concept, definition, objectives, philosophy, History, approaches, principles and skills; community organisation as a method of social work; community welfare councils and community chests; models of community organisation; community participation: concept, imperatives, types, constraints, methods and techniques; components of community work and community relation. Focus Groups; Analysis of Power Dynamics in Various Community, Mobilization for Participation, Involvement in Problem Solving Process: Community Based Organization Building and Federating for Sustained Problem Solving Action.

**UNIT-III:**

Methods of community organisation: Planning, education, communication, community participation, collective decision making, involvement of groups and organisations, resource mobilisation, community action, legislative and non-legislative promotion, coordination. Community Organization in different Fields - Health, Education, Correctional, Rural, Urban and Tribal communities, Vulnerable sections, Disaster. Qualities, Roles and Responsibilities of Community Organizer. Community Organisation at Local, State and National levels.

**UNIT-IV:**

Phases of community organisation: study, assessment, discussion, organisation, action, evaluation, modification, continuation and community study; intervention strategies in community settings: organising, activating, people's participation, negotiating, lobbying, and resource mobilisation,

## **UNIT-V:**

Concept and Evolution of Social Action: concept, objectives and Principles. History and Scope of social action in India. Social work and Social Action. Strategies for Social Action Concept of advocacy as a tool: Strategies for Advocacy - Campaigning, Use of media and public opinion building in advocacy - Coalition and Network building - Approaches: rights-based approach and advocacy-based approach; Radical Social Work: meaning, techniques; Role of Paulo Freire and Saul Alinsky, Role of a social worker in social action.

## **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Conduct a fruitful Community Organisation programme in your own Area on any needy Topic.

## **REFERENCES:**

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3. Friedlander, W.A. 1978) Concepts and Methods in Social Work, Eaglewood Cliffs, New Delhi :Bentice Hall International Inc
4. Ross, Murray &Lappin, Ben 1967 Community Organization; Theory, Principles, and Practice, New York : Harper & Row
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8. Patil, A.R (2013) Community Organisation and Development: An Indian Perspective New Delhi: PHI Learning
9. Joseph, S.(2012). Community Organization in Social Work, Discovery Publishing house.
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11. Parsons, T. (1967). The Structure of Social Action, Free Press

## **COURSE OUTCOMES:**

Upon successful completion of this course the students would be able:

- To gain knowledge on different communities and different lifestyle of communities.
- To have familiarity on community organization as direct method of Social Work.
- To equip with various methods of community organization.
- To gain familiarity in the application of community organization for the welfare of community people.
- To perceive the strategies thoroughly by applying Social Action as a method of Social Work.



PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO							
CO1	3	2	3	2	2	2	3
CO2	3	1	1	3	2	3	2
CO3	2	3	2	2	2	3	2
CO4	3	2	3	1	3	2	3
CO5	2	1	3	2	3	3	1
Average	3	2	3	2	2	3	3

K1= Low, K2= Moderate, K3= Substantial



## PROGRAMME OUTCOMES:

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
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- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

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- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**First Year**

**CORE COURSE-V  
SOCIAL WORK RESEARCH AND  
SOCIAL STATISTICS**

**Semester-II**

**Code:**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES:**

- Develop an understanding of a scientific approach to human enquiry in comparison to the native or common sense approach in various aspects and its process.
- To understand major research strategies, meaning, scope, and importance of social work research.
- To develop an ability to see the linkage between the practice, research, theory, and their role in enriching one another.
- To develop attitudes favourable to the judicious integration practice, research and theory, and to develop skills for the use of library and documentation services for research.
- To develop the ability to conceptualise, formulate, and conduct simple research projects (includes basic research skills such as conceptualisation of a research strategy and problem, writing a research proposal, developing tools for collecting data, use of sampling strategies, data collection methods, processing, presentation, analysis interpretation, writing a research report, etc.).

**UNIT -I      TYPES OF RESEARCH:**

Social Research: Meaning, definition, objectives, characteristics. Social Work Research: Meaning and definition; Difference between social research and social work research; Scientific method: meaning, characteristics; Types of research: pure, applied, and action research; participatory and evaluation research; Qualitative research: meaning, scope, characteristics, difference between qualitative and quantitative research.

**UNIT -II      PROBLEM FORMULATION AND HYPOTHESIS TESTING:**

Selection of problem: criteria and sources defining the problem; Variables: meaning; types of variables; Operationalization; measurement: meaning, levels of measurement; nominal ordinal, interval, and ratio; Hypothesis: meaning, sources, characteristics, functions and types; attributes of a sound hypothesis; hypothesis testing; Level of significance; Type-I and Type-II errors. Theory and fact; inductive and deductive theory construction.

**UNIT- III      DESIGN AND SAMPLING:**

Research design: meaning and types- exploratory, descriptive, diagnostic, experimental. Universe and sampling: meaning, principles and types of sampling; Advantages and disadvantages; Tools/instruments: Types and steps involved in tool construction; Validity and Reliability: meaning and types; Pilot study and Pre-test.

**UNIT -IV      DATA PROCESSING AND REPORT WRITING:**

Sources and Methods of data collection: Primary and Secondary Sources; Methods: Interview- meaning and types; questionnaires; observation: Meaning and definition; types of observation. Data processing;

Editing, Sorting, coding, and transcription. Presentation of data: tabular and graphical presentation; Report writing: content, format and types; footnotes, referencing, and bibliography: meaning and differences; methods of referencing; Plagiarism; ethics and qualities of a good researcher; preparation of research project proposal; agencies involved in social work research.

#### **UNIT -V SOCIAL STATISTICS:**

Meaning, definition, use of Statistics and its limitations in social work research; Measures of central tendency: arithmetic mean, median, and mode; Dispersion: range, quartile deviation, standard deviation, and coefficient of variation; Tests of significance: “t” test, F- test and chi-square test; Correlation: meaning, types, and uses; Karl Pearson’s coefficient of correlation and rank correlation; Computer applications: Use and application of computer in social work research.

#### **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Preparation of a research proposal on a topic selected by each student following the social work research process. Application of statistical tools and testing of hypothesis to be done depending upon the nature of research work.

#### **REFERENCES:**

1. Alan Bryman (2004) Social Research Methods, New Delhi: Oxford University Press.
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5. Clandinin, D. Jean, et al. (1998). "Collecting and interpreting qualitative materials."Personal experience methods
6. Denzin, Norman K., and Yvonna S. Lincoln.(1994). Handbook of qualitative research, Sage Publications, Inc
7. Earl Babbie.(1998). Adventures in Social Research using SPSS,New Delhi: Pine forge Press.
8. Giddens, Anthony, and Jonathan Turner.H.(1987): Social Theory Today.
9. Goode, William J., and Paul K. Hatt.(1952).Methods in social research.
10. Gupta S.P .(2005). Statistical Methods, New Delhi: Sultan Chand Publishers.
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13. Kothari, Chakravanti Rajagopalachari.(2004). Research methodology: Methods and techniques, New Age International.
14. Krippendorff, Klaus. (2012). Content analysis: An introduction to its methodology. Sage,
15. Lakshmi Devi. (1997). Encyclopedia of Social Research,New Delhi :Anmol Publications.
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20. Ramachandran, P.(1993). Survey Research for Social Work: A Primer, Institute for Community Organization Research.

21. Rubin, Allen, and Earl Babbie. (2016). Empowerment Series: Research Methods for Social Work, Cengage Learning.
22. Schutt, Russell K .(2011). Investigating the social world: The process and practice of research, Pine Forge Press.
23. Singleton Jr, Royce A., Bruce C. Straits and Margaret Miller Straits.1993). Approaches to social research, Oxford University Press.
24. Slife, Brent D., and Richard N. Williams .(1995). What's behind the research?: Discovering hidden assumptions in the behavioral sciences, Sage publications.
25. Vijay Rohatgi. (2001). An Introduction to Probability and Statistics, New York :A Wiley – Inter-science Publications, John Wiley & Sons, Inc.,.
26. Young, Pauline V (1996) Scientific social surveys and research, No. 307.2 Y6.
27. Pedagogy: Chalk& Talk, , Seminar, PPT Presentation, Group Discussion and Case Study.

**COURSE OUTCOME on successful completion of the course the students will be able to:**

- Explain the concepts of social research and social work research
- Formulate research problem
- Design Research and Sampling.
- Plan sources and methods of data collection
- Analyse data.

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>1</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>CO4</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>
<b>CO5</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>1</b>
<b>Average</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

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## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

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**First Year**

**CORE COURSE-VI  
CONCURRENT FIELDWORK  
PRACTICE  
(FIELDWORK)**

**Semester-II**

**Code:**

**Credit: 5**

**COURSE OBJECTIVES**

- The broad aim of concurrent field work at this stage is to provide opportunities for the students for applying the knowledge and the information gained in the classroom to real situations. It also provides an opportunity to
- Work with communities (Community Organization), groups (Social Group Work), individuals (Social Case Work) / families and managing organization tasks.
- Learn skills through the practices of primary methods of social work (Case Work, Group Work and Community Organization).
- Inculcate professional growth and development.

**CONCURRENT FIELD WORK (CFW): It is an ongoing learning practice and an opportunity to develop intervention skills in real-life situations.**

- Concurrent field work - agency placement in the generic practice setting such as schools/old age homes/counselling centres/rehabilitation settings, de-addiction centres, Government departments etc. to initiate and participate in direct delivery of professional support to the clients.
- The placement will be for a minimum duration of **30 Field Work days for 2 days per week/semester.**
- Importance to be given to the practice of Social Work methods. Each student is expected to conduct case work with a minimum of 3 clients, group work with at least 2 groups, and organise one community-based programme.
- Submission of the field work reports on the following day before the classes commence.

**GUIDELINES**

**01 Acquiring information about the placement agency:**

Historical Background, Policies, Procedures, Services offered, Activities available, Programmes, Departments, Administrative structure, Roles and Responsibilities of various Professionals, functioning of a multidisciplinary team.

**02 Activities of the trainee social worker:**

- Intake and referral of the Client.
- To function as a member of a multi-disciplinary team.

Participation in other routine activities of the agency such as attending case conferences, conducting surveys, diagnostic camps, maintenance of records, follow-up activities concerning discharged patients etc.

Participation in outreach activities/extension programme of the placement agency.

**03 Practice of social case work –**

with at least 3 individual clients having psycho-social problems, trainee is required to collect detailed casehistories, formulate a comprehensive psycho-social diagnosis, formulate goals of intervention and attempt to alleviate psycho-social problems of their clients using interceptive techniques such as counselling, environmental modification, facilitating catharsis, ego assessment and ego strengthening, behaviour modification etc. Intervention with the family and peer group using appropriate techniques wherever necessary.

Trainee may carry out discharge planning of patients, conduct home visits and other follow-up activities for their client's plan and implement measures for rehabilitation wherever necessary.

**04 Practice of Social Group Work –**

with at least 2 groups of patients or their significant others, to deal with similar problems experienced by the group members. Group formed may be educative, therapeutic, and recreational or self-help groups depending on the members' needs and the agency's scope. Trainee is required to identify members, formulate a group, facilitate group interaction, promote positive group dynamics, enable goal formulation, discuss and help group members to plan measures for goal attainment, implement these plans and wind up group work after evaluating the extent of goal attainment by individuals of the group and the group as a whole.

**05 Community Organization Programme:**

The trainee must organize a community organization programme pertaining to the area of focus of the agency.

**06 Reporting**

Activities of the trainee must be recorded in concurrent reports and have to be consolidated towards the end of fieldwork of which a copy has to be submitted to the agency.

**07 Attendance**

The trainee should report and work on the timings of the agency regularly, except on the days that is mentioned in the covering letter. However, if the agency requires the trainee's service, they can be called on holiday.

**Mandatory Requirements**

**1. Case Work :**

- a) Casework format to be followed with a minimum of 3 interventions
- b) Minimum of 5 sessions

**2. Group Work :**

- a) Group Work report format to be followed
- b) Geo Tagged Photo to be enclosed

**3. Community Organization Programme**

- a) Invitation
- b) Geo Tagged Photo to be enclosed
- c) Newspaper Clipping
- d) Participant List with Signatures

**Process**

- Weekly two days agency visits.
- Faculty - Student individual guidance after the class hours.

**Evaluation Pattern**

- 1. Consolidated Report - Content, Clarity, Language, Presentation
- 2. Agency Evaluation – Regularity, Performance, Skills and Personality Development
- 3. Viva Voce – Communication, Theory, Practice, Clarity (External & Internal Evaluation)

**Norms for Evaluation**

**Evaluation: Internal : 40 marks**

- 1. Case Work Practice - 10 marks
  - 2. Group Work - 10 marks
  - 3. Community Programme - 10 marks
  - 4. Reporting - 5 marks
  - 5. Attendance for field work - 5 marks
- 40 marks  
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**External (60 marks)**

- 1. Theoretical Knowledge - 20 marks
  - 2. Practice Skills - 20 marks
  - 3. Mobilising Resources - 10 marks
  - 4. Communication and Presentation - 10 marks
- 60 marks  
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## COURSE OUTCOME

**After successful completion of this course, the students will be able to learn, re-learn and enhance Basic skills necessary for social work practice such as...**

- Understood both the agency and the clients as systems.
- Developed knowledge of administrative procedures,
- Learned programme management and utilizing skills in practice.
- Developed problem-solving skills.
- Utilized instructions in professional practice.
- Enhanced professional social work trainee.

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>CO2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>1</b>
<b>CO3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>CO4</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO5</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Average</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**First Year**

**CORE CHOICE COURSE-II  
2. GERIATRIC SOCIAL WORK**

**Semester-II**

**Code:**

**(Theory)**

**Credit: 4**

**COURSE OBJECTIVES**

- Develop an understanding of the scope of Gerontology and Geriatrics.
- To develop an ability to see and explore the factors contributing to the growing problems of Older persons.
- To develop an attitude of becoming responsible for taking care of the elderly by family members.
- To sensitize the students about the debilitating impact of ageing on older persons.
- To inform the students of the policies and welfare programmes meant for the older persons

**UNIT- I GERONTOLOGY AND GERIATRICS:**

Concept and Growth: History and Growth of gerontology; Scope and Fields of Gerontology; Geriatric Care: History of Geriatric care in India; Home & Community-Based Care; Fields of Geriatrics; Theories of Aging; Role and Functions of Gerontologist

**UNIT -II FACTORS CONTRIBUTING TO GROWING PROBLEMS OF THE ELDERLY:**

Problems of the Elderly in India; Aging and Risk Factors for Diseases and Disabilities; Elder Abuse and Neglect; Elder Abuse – Causes; Factors and Forms of Elder Abuse; Elder Abuse in India; Medications, Substance Abuse and Older Adult

**UNIT- III ROLE OF FAMILY AND CARE GIVERS:**

Role and Importance of Family and Care givers in Elder Care; Role and Importance of Younger Generations in the Care of Old Persons; Old Age Homes – Types and Services; Need and Importance of Old Age Homes; Services of Old Age Homes; Quality of Life of the Elderly in Old Age Homes

**UNIT- IV WORKING WITH THE ELDERLY:**

Aging and the Body/Body Systems; Effects of aging; Common health problems; Care of the patient and symptoms to report; Aging and the Mind: Mental and personality changes; Temporary changes in mental functioning and causes; Permanent changes in mental functioning and common problems; Caring for clients with memory loss or confusion

## **UNIT -V      POLICIES AND PROGRAMMES FOR THE ELDERLY IN INDIA:**

Legislations for the Elderly in India; Statutory provisions for the elderly; National Policy on Older Persons; United Nations Organization and the Elderly; International Initiatives for Elderly Care; Gerontological social work practice.

## **UNIT - VI      CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Make an analysis of Geriatric care existing in India. Make a survey of Joint families best serving as Geriatric Units in India.

### **REFERENCES**

1. Howard, M. Fillit, Kenneth Rockwood, and Kenned Woodhouse (Ed.).( 2010). Brocklehurst's textbook of geriatric medicine and gerontology, Philadelphia: Saunders Elsevier,
2. Kumudini Dandekar.( 1996). The Elderly in India, New Delhi: Sage Publications.
3. Sinha, J.N.P.( 1989). Problems of Ageing, New Delhi: Classical Publishing Company.
4. Visweswara Rao K.( 2007) Ageing in Rural India, AmbalaCantt: The Associated Publishers.
5. Web Resource
6. <https://www.sp2.upenn.edu/wp-content/uploads/2018/10/794.pdf>
7. [https://main.mohfw.gov.in/sites/default/files/Short%20Term%20Training%20Curriculum%20Handbook\\_Geriatric%20Care%20As](https://main.mohfw.gov.in/sites/default/files/Short%20Term%20Training%20Curriculum%20Handbook_Geriatric%20Care%20As)
8. 20Handbook\_Geriatric%20Care%20As
9. Pedagogy: Chalk& Talk, , Seminar, PPT Presentation, Group Discussion and Case Study.

### **COURSE OUTCOME**

**On successful completion of the course the students will be able to**

- Define Gerontology and Geriatrics
- Identify the problems of Older Persons
- Examine the functions of Old Age Homes
- Assess the impact of the ageing process.
- Evaluate the Policies and Programmes for the older persons



<b>PO &amp; PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	1	2	2	1	3	2	3
<b>CO2</b>	3	1	1	3	2	2	3
<b>CO3</b>	2	3	2	2	3	3	2
<b>CO4</b>	3	2	1	2	3	2	3
<b>CO5</b>	2	2	3	2	3	3	3
<b>Average</b>	3	3	2	2	3	3	3

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
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- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
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- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
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**First Year**

**ELECTIVE COURSE-II**  
**2. SUSTAINABLE DEVELOPMENT**

**Semester-II**

**Code:**

**(Theory)**

**Credit: 3**

**COURSE OBJECTIVES**

- To understand the concept and context of the sustainable development
- To explain and define basic methods and models of sustainable resources
- To analyse and evaluate the indicators of economic growth
- To compare and contrast different energies and resources
- To define and apply the key developmental growth in sustainable development

**UNIT –I:**

Sustainable Development: Concepts and definitions - Models of Sustainable Development - present context and Problems.

**UNIT- II:**

Economic Growth and Equity: Indicators of Economic Growth – GDP, GNP & per- capita income – Economic Growth in relation to Development.

**UNIT- II:**

Environment and energy: Natural resources - availability and utilization – Environmental conservation: Waste reduction and pollution prevention – Non-conventional Energy sources. Technology and Sustainable Development: Appropriate Technologies - new technologies and technology transfer.

**UNIT- IV:**

Social Development: Population stabilization - Perception, Attitude and Behavioral changes (paradigm shift) - social and Cultural Development.

**UNIT- V:**

Development Communication Methods: folk Media (puppet shows, folk Drama, Folk Dances and Folk Songs), Print and Electronic Media. Selecting suitable approaches for different target groups.

**UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

RIO 2012 Issues: Current Ideas on Sustainable Development Goals and Indicators; Focus areas for priority attention: Green jobs, youth employment and social inclusion, Energy access, efficiency, sustainability, Food security and sustainable agriculture, Water, Sustainable cities, Management of

the oceans, fisheries and other marine resources, Improved resilience and disaster preparedness.  
UN: Sustainable Development Goals Report 2020, Sustainable Development Current Affairs

#### **REFERENCES:**

1. Dahama OB & Bhatnagar OP: Education, Communication for Development, Oxford & IBH, New Delhi, 1994.
2. Dhir C. Ishwar: The Indian Economy - Environment and policy – S. Chand & Sons, New Delhi, 2002.
3. Hanley et al : Environment Economics, Mac Millan India Pvt Ltd., New Delhi, 2004.
4. Kumar Arvind: Environment Management, APH Publishing Corp., New Delhi.
5. Mahajan Kamlesh: Communication and society, classical publication, New Delhi 1990.
6. Mishan E.J. The costs of economic Growth, pelican Ramachandra Guha and Martinez Alier J (2000) Environment A Global History Oxford University Press, Delhi 1976.
7. Narindar Singh: Economics and the crisis of Ecology, Oxford University press, Delhi 1976.
8. Pandey P.N. Environment Management, Vikas publications pvt Ltd, New Delhi 1997.
9. Ramachandra Guha and Martinez Alier J., Varieties of Environmentalism, Oxford University press, Delhi 2000.
10. Swaminathan M.S., A. Century of Hope 2000.
11. The world commission of environment and Development, our common future, Oxford University Press, Delhi.
12. Vandana Shiva: STAYING ALIVE: Women ecology and survival at India, Kali for women, New Delhi 1988.

#### **COURSE OUTCOMES :**

- Upon successful completion of this course, the student should be able to
- Understand the concept and context of the field of sustainable development
- Explain and define basic methods and models of sustainable resources
- Analyse and evaluate the indicators of economic growth
- Compare and contrast different energies and resources in sustainable resources
- Define and apply the key developmental growth in sustainable development
- Explain various methods of development communication with suitable approaches for different target groups.

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PSO6</b>
<b>CO1</b>	2	1	2	1	3	1	2	2
<b>CO2</b>	1	3	1	3	2	3	3	2
<b>CO3</b>	2	3	2	2	3	1	2	3
<b>CO4</b>	1	2	1	2	3	2	3	2
<b>CO5</b>	2	2	3	2	3	3	1	3
Optimum point	2	3	2	2	3	3	3	2

K1= Low, K2= Moderate, K3= Substantial



## PROGRAMME OUTCOMES:

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- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

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- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
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- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
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**Second year**

**CORE COURSE- VII  
SOCIAL WELFARE ADMINISTRATION  
AND SOCIAL LEGISLATIONS**

**Semester-III**

**Code:**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES**

- To understand the functions and areas of social welfare administration from a social work perspective.
- To know the social welfare programmes rendered through social agencies.
- To develop the ability to see the relationship between policy and programmes and to analyse the process applied in specific settings and programmes.
- To gain knowledge on policy analysis and policy formulations and to study social policies, plans, legislations and programmes to be able to interpret, enforce, and challenge them.

**UNIT- I:**

Social Welfare Administration meaning and definition of social welfare administration and social work administration; purpose, historical development; principles, functions, and areas (policy making, planning, personnel, supervision, office administration, budgeting, finance, fund raising, accounting, auditing, purchase and stock keeping, record maintenance, co-ordination, public relation, monitoring and evaluation, and research, annual report); social welfare administration at national, state, and local levels.

**UNIT –II:**

Social Welfare Programmes and Agencies Evolution of Social Welfare in India; meaning, Definition, Types, and Models of NGOs; Role of NGOs in National Development Agency Registration: Methods, Advantages & Tax Exemptions for NGOs and FCRA. Government Schemes for NGOs.

**UNIT –III:**

Social Policy: Definition, Need, Evolution and Constitutional Base; Sources and instrument of social policy, Policies Regarding other Backward Castes (OBCs) Scheduled Caste (SCs), Scheduled Tribes (STs) and De-Notified Communities. Policies and programmes for Women, Children, Aged and Handicapped, Development and Implementation of Programmes for weaker sections. Planning Machinery at the State & National Levels and Concepts of Five-year Plan.

**UNIT- IV:**

Social Legislation: Definition, its roles as an instrument of social change, the constitutional basis for social legislation: Fundamental Rights and Directive Principles of State Policy.

## **UNIT- V:**

Laws Related to Marriage: Hindu, Muslim, Christian, and personal laws relating to marriage; divorce, minority, and guardianship; adoption, succession, and inheritance; legislation relating to social problems such as prostitution, juvenile delinquency, child labour, untouchability, physical, and mental disabilities.

## **UNIT - VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Self Study: Social welfare literature and to study India's legal system.

## **REFERENCES:**

1. Chaudhary, D. "Paul Voluntary Social Welfare in India, Sterling Publication (P) Ltd." *New Delhi* (1971).
2. Chaudhary, D. Paul. "Social Welfare Administration." *Atma Ram & Sons, New Delhi* (1979).
3. Dubey, SumatiNarain, and RatnaMurdia. "Administration of policy and programmes for backward classes in India." (1976).
4. Dubey, SumatiNarain. *Administration of social welfare programmes in India*. No. 27. Bombay: Somaiya Publications, 1973.
5. Gangrade, KesharichandDasharathasa. *Social legislation in India*. Concept Publishing Company, 1978.
6. Jacob, K. K. *Social policy in India*. Himanshu Publications, 1989.
7. Jagadeesan, P. *Marriage and Social Legislations in Tamil Nadu*. Elatchiappenn Publications, 1990.
8. Shanmugavelayutham, K. "Social Legislation and Social Change." (1998).

## **BOOKS/E-MATERIALS:**

<https://pdfcoffee.com/social-welfare-administration-pdf-free.html>  
<https://pdfcoffee.com/social-welfare-administration-pdf-free.html>  
[https://www.researchgate.net/publication/249285542\\_Social\\_Policy\\_for\\_Social\\_Work\\_A\\_Teaching\\_Agenda](https://www.researchgate.net/publication/249285542_Social_Policy_for_Social_Work_A_Teaching_Agenda)

## **COURSE OUTCOME:**

- Understand the basic concept, meaning nature of social welfare administration as a method of Social Work
- Understand the provisions of the Indian constitution for creating effective laws in the various fields, especially for marginalized and vulnerable people
- Familiarize various laws in India and its provision and procedure
- Understand the legal literacy system and strategies of India for the betterment of the community
- Understand social legislation as an instrument for Social Work

<b>PO CO</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>
<b>CO1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>
<b>CO3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>
Optim um point	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

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## PROGRAMME-SPECIFIC OUTCOMES:

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- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**Year-II**

**CORE COURSE-VIII  
SPECIALISATION -I**

**Semester-III**

**A. RURAL COMMUNITY DEVELOPMENT**

**Code:**

**(Theory)**

**Credit: 5**

**COURSE OBJECTIVES:**

- To enable students to understand rural realities.
- To develop sensitivity and commitment to working with rural communities.
- To impart knowledge about the governmental and voluntary efforts towards rural community development.
- To equip students with specific skills and techniques for working with rural communities.

**UNIT-I:**

Rural Community: meaning, characteristics; types of villages; scope of studying the rural community and its relation to social work; rural social structure and constraints to rural development; rural organisation and rural development - school, co-operatives, village panchayat, youth club, women's club, self-help groups etc.

**UNIT-II:**

Community Development: meaning, Definition, objectives, scope, principles, process, models; methods; earlier experiments in rural developments - Sriniketan experiment, Gurgaon experiment, Marthandam experiment, Baroda experiment, Firkha development scheme, Etawa pilot project, Nilokheri experiment, Gandhian constructive programmes; community development during post launching period: national extension services: concept, characteristics, philosophy, objectives, principles, approaches, and methods and limitations; approaches to rural community development: Tagore, Gandhi and C. Subramaniam, etc.

**UNIT-III:**

Rural Development Administration: history, structure- central - state, district and block levels and functions, panchayat raj institutions (PRI): origin & evolution; philosophy, new panchayat raj system- 73rd amendment and its salient features, structure of PRIs; powers of Gram Sabha; features of Tamil Nadu Panchayat Act, 1994; constitution of village panchayats, panchayat union and district panchayat; reservation for women SC/STs, Government of India finance commission, state finance commission, development grants under various schemes rural development agencies: Council for Advancement of People's Action and Rural Technology (CAPART), National Institute of rural development (NIRD), National bank for agriculture and rural development (NABARD), Regional rural banks (RRB), district rural development agency (DRDA); statistics related to rural development; training of PRI functionaries, Recent Government Programmes., Asset-based Community Development.

#### **UNIT-IV:**

Agriculture and rural development: share of agriculture in the national income, agriculture as a source of livelihood, employment, raw materials, capital for development and manpower; agrarian and land reforms, Green, white and Yellow revolution; cooperatives and rural development. Programmes, National Rural Livelihood Mission (Ajeevika), MKSP, National Rural Health Mission. Contributions of NIRD, SIRD. Rural Banking: RBI, NABARD, RRB, Cooperatives, Agricultural Banks and other financial institutions.

#### **UNIT-IV: GOVERNANCE**

Rural Governance: Meaning, Structures, Organization and administration: Panchayat, Block, District, State and Nation. Role and Functions of functionaries. E-Governance in Rural Development. Rural Local Self Government: Democratic Decentralization and Panchayati Raj System. Balwant Rai Mehta Committee Report, Ashok Mehta Committee Report, 73rd Amendment of Constitution, Tamil Nadu Panchayat Raj Act, 1995. Panchayat Raj and Community Development.

#### **UNIT-V:**

Rural Development Programmes: Area-based Programmes- drought-prone area programme (DADP), hill area development programme (HADP), command area development programme (CADP), wasteland development programme, Desert development programme (DDP), watershed development programme, hariyali , MP's area development programme; MLA's area development programme; etc.; target-based programmes: NREP, RLEGP, SPMRM (RURBAN), SaansadAdarsh Gram Yojana(SAGY), PradhanMantriAwaasYojana-Gramin, millions wells scheme, Deen Dayal Upadhyaya Grameen Kaushalya Yojana, Pradhan Mantri Gram Sadak Yojana, employment assurance scheme, new life, etc; employment guaranty legislation – its salient features- *MGNREGA*, welfare programmes: minimum needs programme, Mission Antyodaya2020, Annapoorana scheme, programme of rural health and total sanitation; five-year plans and NITI Aayog strategies for rural development, and role of social workers, concept of provision of urban infrastructure in rural areas (PURA), role of voluntary organisation in rural community development, problems

#### **UNIT-VI: CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Collecting data on the functioning of any government office in your own area.

#### **REFERENCES:**

1. Mathur, BasantLal. Rural Development and Co-operation.RBSA, 2000.
2. Singh, Hoshiar. Administration of rural development in India.Sterling, 1995.
3. Singh, Katar. Rural development: principles, policies and management. Sage, 1999.
4. Sundaram, I. Satya. Rural development: A textbook for university and college students. Himalaya Publishing House, 2007.

5. Weil, Marie. Community practice: Conceptual models. Vol. 3. No. 3-4. Psychology Press, 1996.
6. Chambers.R, 1983 Rural Development: Putting the Last First, Harlow, Longman,
7. Desai A.R,1995 Rural Sociology in India, ISAE, Bombay
8. Jain, S.C.,1998 Community development and Panchayat Raj in India, AlliedPublishers Ltd., Chennai-2
9. Jain, S.C.,1998 Rural Development Institute and Strategies, Raws Publications,New Delhi.
10. S. Rengasamy 1999, Introduction to Rural Community Development, Madurai Institute of Social Sciences, Madurai

**COURSE OUTCOMES:**

**Upon successful completion of this course the students would be able:**

- To describe the conceptual framework related to Rural Community Development.
- To Deliberate on basic concepts of Rural Community development.
- Classify the needs and significance of Rural community development.
- To analyze the policies of programmes of Rural Community Development.
- To have familiarity with legislative provisions related to rural Community Development.

<b>PO CO</b>	<b>PO 1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>
<b>CO1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>
<b>CO2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>
<b>CO3</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO4</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>
Optimum point	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>

K1= Low, K2= Moderate, K3= Substantial





## PROGRAMME OUTCOMES:

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
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**Second Year**

**CORE COURSE-VIII  
C. HUMAN RESOURCE MANAGEMENT  
(Theory)**

**Semester-III**

**Code:**

**Credit: 5**

**COURSE OBJECTIVES**

- To teach the students about human resource practices.
- To enlighten the students on human resource management.
- To inform the students about human resource functions and apply the terms and conceptual models to specific and especially new contexts.
- To educate the students on the effective application of HRM processes in an Industry.
- To enlighten the students about industrial social work.

**UNIT I:-**

**Management:** Concept, elements, principles and functions of management; management thoughts: Henry Fayol, F.W.Taylor, and Peter Drucker.

**UNIT- II:**

**Human resource management:** Definition, scope, evolution, and functions. Contemporary HRM thoughts: Guest, Legge and Purcell. Indian HRM thought. HRM critical appraisal: Reservations, relevance and reactions. Current challenges of HRM Human resource policy: Formulation and implementation; duties, responsibilities, and qualities of Human Resource Manager and challenges for the 21<sup>st</sup> century.

**UNIT –III:**

**Human Resource functions:** Human resource planning, recruitment, selection, induction and placement, promotion, transfer, job analysis, training, performance appraisal; discipline and disciplinary procedure, personnel records and personnel research; HR audit.

**UNIT- IV:**

**Wage and salary administration:** job evaluation: definition, objectives; methods, advantages and limitation; wage and salary administration: nature and purpose, process of wage determination, wage structure and principles; theories of wages: concepts of wages, wage differentials – financial and non-financial incentives.

**UNIT- V:**

**Industrial social work:** meaning, scope, and relevance; application of social work methods in the industrial sector; labour problems and industrial counselling in industries and working with the families of industrial workers: meaning, scope, relevance, advantages and disadvantages.

## UNIT VI: CURRENT CONTOURS (For Continuous Internal Assessment Only)

Self Study: Globalization and competitions of Human Resource Management work force.

### REFERENCES

1. Agarwal, RameshwarDayal, ed. *Dynamics of Personnel Management in India: a Book of Reading*. Tata McGraw-Hill, 1973
2. Davar, Rustom S. *Personnel management and industrial relations in India*. International Book Distributors, 1976.
3. Flippo, Edwin B. *Principles of personnel management*. McGraw-Hill, 1976.
4. Fraser, John Munro. *Introduction to personnel management*. Nelson, 1971.
5. Indian Institute of Personnel Management. *Personnel Management in Indi*. Asia Publishing. 1977.
6. Mamoria C.B. *personnel management*. Himalaya Publishing House. 1985
7. Prasad, L.M (2018), *Principles and Practice of Management*
8. Prasad L.M, 2017, *Human resource management*, New Delhi, Sultan Chand and

### E-BOOKS/E-MATERIALS:

1. <https://www.ciphr.com/features/seven-best-hr-ebooks/>
2. <https://camosun.libguides.com/hrm/books>
3. <https://learn.library.ryerson.ca/HRM/books>
4. <http://www.freebookcentre.net/Business/Human-Resources-And-Personnel-Management.html>

### COURSE OUTCOME

- Develop an ability to undertake qualitative and quantitative research
- Apply knowledge about qualitative and quantitative research to an independently constructed piece of work
- Identify and apply new ideas, methods and ways of thinking
- Demonstrate competence in communicating and exchanging ideas in a group context
- Be able to advance well-reasoned and factually supported arguments in both written work and oral presentations
- Work effectively with colleagues with diverse skills, experience levels and way of thinking
- Be able to evaluate HRM-related social, cultural, ethical and environmental responsibilities and issues in a global context

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>
<b>CO1</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>
<b>CO4</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>1</b>
<b>CO5</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO6</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>CO7</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>
Optimum point	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
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- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
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**Second Year**

**CORE COURSE-VIII  
D. HEALTH AND HYGIENE  
(Theory)**

**Semester-III**

**Code:**

**Credit: 5**

**COURSE OBJECTIVES**

- To give awareness of the basic concept of health and illness.
- To sensitize on communicable and non-communicable diseases.
- To provide knowledge about the various dimensions of illness.
- To sensitize the importance of hygiene and health education.

**UNIT – I**

Concept of Health: Definition, concept, objectives, nature, need and scope, its relationship to welfare; influencing the health status of individuals; Multiple causations of diseases; Factors involved in the process of disease transmission; Specific and Comprehensive Health Indicators; Vital Health Statistics; Healthy life style.

**UNIT - II**

Nutrition and Health: Nutrient Groups: Functions, sources and requirements; Caloric requirements for different age groups; Balanced diet, Malnutrition, Deficiency diseases, prevention of Nutrition problems.

**UNIT - III**

Hygiene: Personal, food and Environmental hygiene; Relationship between health and hygiene; Environmental pollution; Living conditions; housing, sanitation, waste disposal and their influence on health.

**UNIT - IV**

Major Communicable / Non- Communicable Diseases: Symptoms, Etiology, Transmission, Prevention and Treatment of Leprosy, Tuberculosis, STD, HIV, Polio, Malaria, Cholera and Typhoid. Immunization schedule for children. Cancer, Diabetes, Hypertension, Asthma, Cardiac disorders. Occupational Health: Occupational Health Hazards, Common Occupational Diseases.

**UNIT - V**

Health Education: Meaning and importance, Principles of health education, Techniques and strategies for various community groups, use of Audio-Visual Aids and Mass Media; First Aid: methods of dealing with victims of accidents. Family Planning: Importance and Techniques;

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only )**

Students are expected to read WHO Data and Statistics, WER - Weekly Epidemiological Records and current health issues of world and local.



## REFERENCES

1. Banerjee G.R.: Social Service Department in hospitals – its organisations and functions, TISS, Barmby, 1950.
2. Goel, S.L. Public Health Administration, Sterling Publishers, New Delhi, 1984.
3. GoldsteinDora : Expanding Horizons in Medical Social work; University of Chicago press, 1955.
4. Kumar R : Social and Preventive health administration, Asia Publishing House, New Delhi – 1992.
5. MinnaField : Patients are people, Columbia University Press, New York, 1953
6. Park, J.E. & Park K : Text Book of Preventive and Social Medicine; Jabalpur, M/s. Banashidas 1983.
7. WHO : Social Dimensions of Mental Health, Geneva, WHO, Publications, 1981.
8. Yash Paul Bedi : Hygiene and Public Health.

## COURSE OUTCOMES

- Upon successful completion of this course, the student should be able to understand the concept of health
- Know the caloric requirements, malnutrition and balanced diet for the prevention of Nutrition problems
- Provide information on health and hygiene
- Understand the cases, mode of transmission and consequences of communicable and non-communicable diseases
- Conduct programmes on health and hygiene
- Educate the people about the principle and importance of health through visual aids and mass media.

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>
<b>CO1</b>	2	1	1	3	2	1
<b>CO2</b>	1	2	2	1	1	3
<b>CO3</b>	3	2	1	1	2	2
<b>CO4</b>	1	3	1	2	3	2
<b>CO5</b>	2	2	1	3	1	3
<b>CO6</b>	2	2	3	2	3	2
Optimum point	2	2	1	3	3	2

K1= Low, K2= Moderate, K3= Substantial



## PROGRAMME OUTCOMES:

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
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- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

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- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
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- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

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**Second Year**

**CORE COURSE-X  
CONCURRENT FIELD WORK PRACTICE  
(Fieldwork)**

**Semester-III**

**Code:**

**Credit: 5**

The course is so designed to facilitate specialization-based field exposure to takers. Fieldwork placements are arranged accordingly in Clinical and Psychiatric Settings, Industries, Corporate, NGOs, and Governmental Projects. The trainees so placed gain hands-on experience and the nuances of social work practicum in these different settings.

**COURSE OBJECTIVES:**

**The main objectives of this course are to:**

- Facilitate Social Work Trainees and be exposed to social issues related to their fields of specialization.
- Gain Knowledge of Social Work Practice in Professional Social Welfare Agencies/Beneficiary Organizations
- Develop a practical understanding needs/challenges of people in their fieldwork agencies
- Apply social work methods and techniques in their field of specialization
- Uphold the Ethics and Values of the Social Work Profession in their fields of specialization

**A. Standard Operating Procedures (SOPs)**

- a. **Timing** The Social Work Trainees are expected to strictly adhere to the official working hours of the Agency and be punctual. They should report to the agency on-time.
- b. **Availability:** The trainee should report and work on the timings of the agency regularly, except on the days that are mentioned in the covering letter and be available throughout the agency's official working hours. However, if the agency requires the service of the trainee they can be called on holiday too.
- c. **Required Number of Days and Hours:** The trainees are expected to fulfil a minimum of 30 days which may be for a duration of 8 to 12 weeks on a concurrent basis where the trainees are expected to report on Tuesdays, Thursdays and Saturdays.
- d. **Dress Code:** Only formal dress will be allowed
- e. **Attendance:** 100% attendance in field work is compulsory for successful completion and getting pass. A trainee should report and work on the timings of the agency regularly, as

mentioned in the covering letter addressed to the Agency in this regard. However, if the agency requires the service of the trainee, they can be called on holidays

- B. **Reporting and Documentation:** Activities of the trainee must be recorded in concurrent reports and have to be consolidated towards the end of fieldwork of which a copy has to be submitted to the agency.
- C. **Mentoring & Guidance by the Agency Supervisor:** The Agencies would a staff or administrators to be the Trainee's supervisor. The agency supervisor would Supervise the Trainees in their fieldwork, overseeing the entire range of field experience., Ensure trainee's activities are meeting field education objectives., Maintain regular contact with the Trainee and other agency supervisors involved in the internship., Formally meet with the Trainee at least 30 minutes a day to monitor the trainee's progress and suggest and Approve the activities of the Trainee by signing the duly filled-in 'Time Sheet' available with the trainee
- D. **Individual Conference with the Faculty Advisor:** The trainee will be provided with a timer for an individual conference on all Mondays, Wednesdays and Fridays. The time to be provided is about an hour. They are expected to submit written records of work done and the faculty supervisor is expected to enter comments before the conference.
- E. **FIELD WORK REPORT**

A fieldwork report is a crucial aspect of social work field practice. The template could follow the following sequence: the purpose of the visit, observation, content, impression, worker's role, and next plan of action.

  - a) **Purpose of the visit:** The social work trainee is expected to state his / her mission, intention or aim of visiting the agency.
  - b) **Observation:** The student social work trainee is expected to give an account of all that is around him in the agency that has a direct or indirect bearing on the object/subject of intervention. The scope of inference must be problem-specific.
  - c) **Content:** All that transpired between the student and his client/ employee/ member of the Community in the course of the intervention, constitutes the content.
  - d) **Impression:** This is a subjective expression of the student trainee's goal assessment. The student trainee is at liberty to state his feelings, cognitive judgment, and general expectations with regard to his client/employee /member of the Community and the overall intervention process.
  - e) **Trainee's role:** The trainee is expected to describe all the skills, methods/techniques he or she adopted in the intervention process.
  - f) **Next plan of action:** The student trainee is expected to state what will become his next line of action or better still, what he/she intends to do in the next fieldwork schedule.

Evaluation: Internal : 40 marks

- 1. Case Work/Case study Practice/ Need Analysis Survey - 10 marks
- 2. Group Work/PRA/ SWOC/ Mini Research/ - 10 marks
- 3. Awareness Programme - 10 marks
- 4. Reporting - 5 marks
- 5. Attendance for field work - 5 marks

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40 marks

External (60 marks)

- 1. Theoretical Knowledge - 20 marks
- 2. Practice Skills - 20 marks
- 3. Mobilising Resources - 10 marks
- 4. Communication and Presentation - 10 marks

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60 marks

## **COURSE OUTCOME**

After successful completion of this course, the Social work trainees will be able to attend the following tasks in an enhanced professional manner:

- Increase the coping capacity of all clients by effectively utilizing the problem-solving model.
- Participate fully in contribution to the modification/formulation of various social policies or influencing most social policies from its formative stage.
- Create awareness by educating, advocating, and concentrating on conscientizing the society to utilise available human and materials resources effectively.
- Harmonizing human relationships in their physical and social environments through rehabilitation, reconciliation, and re-integration, where and when necessary.
- Help in rural transformation by making rural life more meaningful to the people by helping them to achieve self-reliance.

PO CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	1	3	2	1
CO2	1	2	2	1	1	3
CO3	3	2	1	1	2	2
CO4	1	3	1	2	3	2
CO5	2	2	1	3	1	3
Optimum point	3	2	1	3	2	3

K1= Low, K2= Moderate, K3= Substantial





## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**Second Year**

**CORE CHOICE COURSE-III  
SPECIALISATION- II  
A. TRIBAL COMMUNITY DEVELOPMENT**

**Semester-III**

**Code:**

**(Theory)**

**Credit: 4**

**COURSE OBJECTIVES:**

- To enable students to understand the unique nature of tribal culture.
- To develop sensitivity and commitment for working with the tribal community.
- To provide knowledge on the government and voluntary efforts towards tribal development.
- To equip students with specific skills and techniques for working with tribal communities.

**UNIT-I:**

Tribes: definition, concept, types, characteristics of the tribal community; nomadic and denotified tribes; history of Indian tribes and tribes in Tamil Nadu; regional distribution of tribes and Nehru's Panchsheel principles of tribes;

**UNIT-II:**

Social System of Tribes: Socio economic Conditions, Animism, Totemism cultural and religious aspects; status of women: dress, food, & marriage-polygamy, polyandry, dormitory marriage; status of children; language, tribal leadership and political participation -local, state, and national levels.

**UNIT-III:**

Tribal Development Administration: Administrative structure at central, state, and district levels; hill development councils; Tribal Co operatives, Functions of tribal development blocks/agencies; constitutional provisions for the protection of tribes; research and training in tribal development, role of voluntary agencies in tribal development, Functions of Ministry of Tribal Affairs

**UNIT-IV:**

Problems of Tribes : child marriage, poverty, ill-health, illiteracy, sexually transmitted diseases and acquired immune deficiency syndrome, exploitation and atrocities on tribes; immigration and its related problems; lack of infrastructure facilities and amenities; tribal resettlement and rehabilitation and its related problems; tribal movements and tribal revolt, problems in the implementation of tribal development programmes, Livelihood issues, eviction, Forest dwellers' rights, Tribal displacement

## **UNIT-V:**

Tribal Development Programmes and Interventions: Major tribal development programmes - Tribal Area Development Programme; Hill Area Development Programmes[HADP]; Tribal Sub-Plans [TSP] Forest Land Cultivation. Recent Programmes in India, Role of voluntary organization in tribal development. Need and importance of Social Work Practice in Tribal Areas, Application of Social Work Methods in Tribal development

## **UNIT-VI: CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Conducting Case Study on any tribal group to know their felt needs

## **REFERENCES:**

1. Devendra Thakur (1994) Tribal life in India (Ten Vols), Deep & Deep Pub., New Delhi.
2. Babuji, M. (1993) Tribal Development Administration, Kanishka Pub., New Delhi.
3. Sing & Vyas (1989) Tribal Development, Himanshu, New Delhi,
4. Chaudhuri. Tribal Development in India, Inter India Pub. 1981
5. Patel, Mahendra Lal. Planning strategy for tribal development. Vol. 111. Inter-India Case study Publications, 1984.
6. Rajeeva. An Introduction to the Tribal Development in India, International. 1988
7. Ramana, Rao DVV. "Tribal Development." (1992).
8. Singh, J. P., and N. N. Vyas. Tribal development: past efforts and new challenges. Himanshu Publications, 1989.
9. Thakur, Devendra, ed. Tribal Life in India: Industrialisation in tribal areas. Vol. 4. Deep & Deep Publications, 1994.
10. L.P. Vidyarthi & Binay Kumar Rai, 1976, The tribal culture of India, Concept publishing company, New Delhi

## **COURSE OUTCOMES:**

**Upon successful completion of this course the students would be able:**

- To describe the nature and types of tribal community.
- To have familiarity with the Social system of tribal community.
- To evaluate the tribal development administration.
- To analyze the problems and programmes for the tribal community.
- To have clarity on development programmes and legislations for the welfare of tribal community.

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>
<b>CO1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>CO2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>
<b>CO4</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>
<b>CO5</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>3</b>
Optimum point	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
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- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
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**Second Year**

**CORE CHOICE COURSE-III  
SPECIALISATION -II  
B. HUMAN RESOURCE DEVELOPMENT**

**Semester-III**

**Code:**

**(Theory)**

**Credit: 4**

**COURSE OBJECTIVES**

- To teach the students the concept of human resource development
- To educate the students about training and development as a part of human resource development.
- To make students aware of the current trends in human resource development.
- To enlighten students on the concept of leadership.

**UNIT- I:**

Human Resources Development: HRD- concept, objectives, components, process, and mechanism for HRD, principles in designing HRD system; Human resource planning (HRP): meaning, historical development, importance; subsystems and elements; process; HRD at different levels; Areas of HRD; HR information system, demand and supply of human resources, HR planning in new and ongoing organisations; investment approach to HR planning.

**UNIT -II:**

Performance Appraisal: meaning, approaches to performance appraisal, methods/techniques of appraisal system, importance, purpose and limitation; potential appraisal: meaning, scope and importance, latest trends in potential appraisal; 360 performance appraisals; management by object; stress management and conflict at work place: meaning, causes and consequences, strategies for reduction of stress; conflict: meaning, types of conflict and management of conflict

**UNIT -III:**

Training and Development: meaning, need, importance, types: on the job and off the job training, training effectiveness, evaluation of training programme; career planning and performance counselling: meaning and steps involved; career development: steps importance and problems, succession planning; performance counselling: conditions for effective counselling, process involved.

**UNIT -IV:**

HRD Trends: job rotation, job enlargement, job enrichment. Quality of work-life, total quality management (TQM) human resource information system: meaning and importance; ISO 9000 series, competency management meaning & importance; People capability, maturity, model – meaning and importance.



## **UNIT- V:**

Leadership: concept, leadership and management-difference, styles, skills, teamwork, decision-making and steps; theories of leadership, motivation: concept, motivation skills and theories of motivation: drive theory, incentive theory, opponent-process theory, optimal level theory.

## **UNIT-VI: CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Self-study: HRD in the current dynamic business environment, Green HRD in India

## **REFERENCES:**

1. Bhatia, B. S., and G. S. Batra. Human Resource Development. Vol. 6. Deep and Deep Publications, 2001.
2. Chandra, S. "Human Resource policy." A blue print in alternative approaches and Strategies of HRD, TV RAO et. al., Rawat Pub., Jaipur (1988).
3. Chhabra, T. N. "Human Resource Management-Concept and Issues." Delhi: Dhanpat Rai & Co.(P) Ltd. view of Economic Studies 71 (2001): 514-534.
4. Craich Robert, L. "Training and Development-Hand book." (1987).
5. JeyaGopal, R. Human Resources Development – Connectional analysis and strategies, sterling pub. 1993
6. Joseph, Famularo. "Hand book of Human Resources Administration." (1987).
7. Kandula, Srinivas r. Human resource management in practice: with 300 models, techniques and tools. Phi Learning Pvt. Ltd., 2003.
8. Mehta, Basant, and Kiran Kothari. Human resource development. Discovery Publishing House, 1999.
9. Memoria, C. B. "Personnel Management, Himalaya Pub." House, Bombay (1984).
10. Monappa, Arun, and S. Saiyadain Mirza. "Personnel Management, (2000)." Tata Mc.
11. Pattanayak, Biswajeet. "Human Resource Management (2002)."
12. Rao, T. Vekateshwara. "The HRD missionary." (1990).
13. Singh, Bhavdeep, and P. C. Kumar. "Current Trends in Human Resource Development." (1995).
14. Thamarajakshi, R. Human Resource Development in Asian Countries: An Integrated Approach. ILO-ARTEP, 1988.

## **E-BOOKS/E-MATERIALS:**

1. <https://www.ignouadmission.in/ignou-study-material/>
2. <https://www.google.com/search?q=e+books+and+e-materials+for+HUMAN+RESOURCE+DEVELOPMENT&tbm=isch&ved=2ahUKEwjnP4rsjAhX4mdgFHX6xCd8Q2-cCegQIABAA&oeq=>
3. AhX4mdgFHX6xCd8Q2-cCegQIABAA&oeq=
4. <https://www.routledge.com/e-HRM-Digital-Approaches-Directions--Applications/Thite/p/book/9781138043978>

## COURSE OUTCOMES

- Explain human resources development (HRD) and its theories, the difference between education, training, learning and the concept of the transfer of learning;
- Critique the relationship between organisational development (OD) and HRD contribution to organisational effectiveness;
- Apply and evaluate a learning process starting with training needs analysis to assessment and evaluation process;
- Evaluate the HRD role dealing with contemporary challenges.

PO CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	1	2	1	2
CO2	3	1	1	2	2	2
CO3	3	2	1	1	1	2
CO4	1	1	3	2	3	2
Optimum point	3	2	1	2	1	2

K1= Low, K2= Moderate, K3= Substantial



## PROGRAMME OUTCOMES:

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
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- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
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**Second Year**

**CORE CHOICE COURSE-III  
SPECIALISATION- II  
C. MENTAL HEALTH**

**Semester-III**

**Code:**

**(Theory)**

**Credit: 4**

**COURSE OBJECTIVES:**

- To give knowledge about the concept and origin of psychiatry as a special field.
- To orient about the various aspect of psychiatric illness.
- To impart knowledge about the assessment of psychiatric illness.
- To foster the skills to mitigate and manage the illness through intervention.
- Suggested Teaching / Learning Methodology
- Lectures, PPT, Discussion, Small Group Exercises, Brain Storming,
- Assignment, Seminar, Group/Mini Project, Filed / Observation Visits
- Invited guest speakers / practitioner - discussion and interaction

**UNIT -I:**

Mental Health, Mental Illness and Mental disorders – concept, Attitude and beliefs pertaining to Mental illness in ancient, Medieval and Modern times. Concept of Normality and Abnormality.

**UNIT –II:**

Symptoms, Etiology, diagnosis, Prognosis and management of a) Neuroses- Anxiety States, Depressive reaction, Obsessive-compulsive reaction, Convulsive disorder, Phobic reaction, Hypochondrias b) Psychosis- Functional, Affective disorders, Organic disorders. Psychiatric assessment; interviewing – Case history taking and mental status examination, psychosocial and multidimensional assessment of mental disorders in psychiatric social work and psychosocial diagnosis.

**UNIT –III:**

Psychiatric Illness: Symptoms, causes of Neuroses, Psychoses, cultural bound syndromes, personality disorders, sexual deviations, alcoholism and drug dependence and suicide. Childhood disorders, scholastic Back wardens – attention deficit disorders – Learning disorders, Specify Mental Health problems among children, adolescents, women, workers, and elderly. Mental disorders: Mental retardation, Definition, classification, clinical types and causes, cerebral palsy: Epilepsy: Definition, types, causes, Management. National Trust Act 1982, National Mental Health India 1987.

#### **UNIT –IV:**

Symptoms, Etiology, diagnosis, Prognosis and management of a) Psychosomatic disorder, b) Personality disorder- alcoholism, Substance abuse, anti-social Behaviour, Sexual disorder, deviations, c) Psychiatric problems among children and adolescents d) epilepsy, e) Mental retardation, Mental Health Care system – policies and programmes in India. Critical Review of existing policies and legislations

#### **UNIT –V:**

Classification of mental illness and policies, DSM IV, ICD 10, ICF, FIC, National Trust Act 1982, National Mental Health India 1987. Community psychiatry- History, Principles and Practices. Primary, Secondary and Tertiary Prevention.

Mental Health Act-Its implication to Professional Social Work, District Mental Health Programme - History, importance and Applications Role of social workers in specialized mental health institutions, stress and crisis intervention centres

#### **UNIT -VI: CURRENT CONTOURS (For Continuous Internal Assessment Only)**

WHO's fact and figure, recent reports and study, Policy Statements, Research reports, related publications – students are expected to prepare their assignment and seminar presentation from this unit

#### **REFERENCES:**

1. Coleman, James C: Abnormal Psychology and Modern life. Taraporevala & Sons Bombay.
2. Hughes Jennifer : An outline of modern psychiatry, John Wiley & Sons, 1981.
3. Kaplan Harold et al : Comprehensive Text book of Psychiatry, Williams & Wilkins, Vol I, II & III, 1980
4. Kraepelin, E Wil : a Psychiatry – A Text Book for students and physicians, Vol.2, Amerind pub, 1990.
5. Sellar Parth WHO. ICIDH, Geneva 2002.
6. Venkatesan S. Children with development disabilities, sage (2004).
7. Abraham F.(2014). Social Work in Mental Health, Sage, New Delhi.
8. Gelder.M, Harrison.P & Cowen .P(2009). Shorter Oxford Textbook of Psychiatry, Oxford University Press, New Delhi.
9. Mental Health and Psychiatric Nursing, AITBS

#### **COURSE OUTCOMES**

**Upon successful completion of this course, the student should be able to**

- Identify and define basic term and concept mental health
- Outline the scientific methods of mental health counselling
- Understand the mental health issues and problems of a psyche
- Aware of various aspect of psychiatric illness
- Skillful in mitigate and manage the illness through intervention

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>
<b>CO1</b>	2	1	2	3	1	2
<b>CO2</b>	1	2	2	1	2	3
<b>CO3</b>	2	3	3	2	2	2
<b>CO4</b>	2	3	2	2	2	1
<b>CO 5</b>	3	2	1	2	1	1
Optimum point	2	2	2	2	2	2

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
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- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
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- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice



## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**Second Year**

**ELECTIVE COURSE-III  
SPECIALISATION -III  
A. DEVELOPMENT COMMUNICATION**

**Semester-III**

**Code:**

**(Theory)**

**Credit: 3**

**COURSE OBJECTIVES:**

- To acquire theoretical knowledge on development communication and its methods.
- To have skills in various traditional mass communication tools for community development
- To know the advantages and disadvantages of using various mass communication media.
- To know the role of government and voluntary agencies in promoting development through ICT.

**UNIT-I:**

Development: Concepts and Approaches; Communication: Meaning, Definition, Scope and Purpose; Elements, Principles, Characteristics, Functions, Channels and Stages, Skills and Techniques of Communication; Communication Process; Development Communication: Meaning, Concept and Scope, Paradigms of Development Communication

**UNIT-II:**

Methods of Communication: Interpersonal Communication, Group Communication and Mass Communication; Types; Mass Communication: Meaning, Development and Scope; Role of Mass Media in Social Development and National Development, Limitations in the use of Mass Media in India, Community Radio and Development

**UNIT-III:**

Theories and Models of Communication: Communication Theories: Magic Bullet, Needle, Spiral Theories Communication Models: Aristotle's, Lasswel's, Newcomb's, DavidBerlo's and SMCR Model; Transactional Analysis and Conflict Resolution.

**UNIT-IV:**

Selection of Suitable Approaches for Different Target Groups; Audio-Visual Aids and ICT: Types and its Uses, reach and access. Folk Media: Puppet Shows, Drama, Street Play, Folk Songs and Folk Dances, Use of Talks, Meetings, Conference, Workshops; Campaign: Communication Through Documentary, Leaflets, Pamphlets, Bulletins, Circulars, Posters and Notice Boards, Role of Field Publicity Office. E-posters, App-Based Communication and Online Campaigning through Social Media and Social Networking Sites, Recent Strategic Approaches to Development Communication.

## **UNIT-V:**

Communication Research: Steps and Approaches; Satellite Instructional Television Experiments (SITE): Aims and Objectives; Satellite Communication for National Development; Social Implications of Mass Communication; Barriers to Communication.

## **UNIT-VI CURRENT CONTOURS (For continuous internal assessment only)**

Prepare a pamphlet to educate people on basic Health Condition

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10. Fuglesang, Andreas, Applied Communication in Developing Countries – Ideas and
11. Observations, Dag Hammarskjold Foudstion, Uppasla, 1973.
12. Patnakar, Pandit&Lilian Day, Social Communication and Family Planning, Orient Longman, New Delhi, 1973.
13. Pokharapurkar, Rural Development and Community Television, Concept Pub., New Delhi, 1993.

### **COURSE OUTCOMES:**

**Upon successful completion of this course the students would be able:**

- To understand the concepts of development and communication.
- To classify different methods of communication.
- To evaluate the theories and models of communication.
- To examine the approaches for the benefit of different target groups.
- To have deep knowledge on communication research.

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>
<b>CO1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>
<b>CO2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>
<b>CO3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>
<b>CO4</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>
<b>CO 5</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>3</b>
Optimum point	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>

K1= Low, K2= Moderate, K3= Substantial



## PROGRAMME OUTCOMES:

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- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
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## PROGRAMME-SPECIFIC OUTCOMES:

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Second Year

**ELECTIVE COURSE-III  
SPECIALISATION -III  
B.ORGANISATIONAL BEHAVIOUR AND  
ORGANISATIONAL DEVELOPMENT**

Semester-III

Code:

(Theory)

Credit: 3

**COURSE OBJECTIVES:**

- To know themselves and be able to recognize individual differences in others.
- To understand OB/OD theories that influence individual and group behaviour – perception, attitude formation, motivation, role theory etc.
- To understand how to form effective work teams.
- To understand how to change an individual's attitude and motivation.
- To understand how to build effective team leadership.

**UNIT –I FOCUS AND PURPOSE OF OB :**

Definition, need and importance of organizational behaviour nature and scope – framework – organizational behavior – models; **Individual behaviour:** personality – types – factors influencing personality – theories; learning: learning process – learning theories – organizational behaviour modification; attitude: characteristics – components – formation; perception: importance – factors influencing perception; motivation – importance – types – effects on work behavior.

**UNIT- II GROUP BEHAVIOUR:**

Organization structure – formation – groups in organizations – influence – group dynamics – emergence of informal leaders and working norms – group decision making techniques – interpersonal relations – communication – control – Hawthorne studies; **leadership and power** – meaning – importance – leadership styles – theories – leaders vs. managers – source of power – power centers – power and politics.

**UNIT -III DYNAMICS OF ORGANIZATIONAL BEHAVIOUR:**

Concept of organizational culture and climate – factors affecting organizational climate; job satisfaction – determinants – measurements; organizational change – importance – change process – resistance to change – managing change; organizational effectiveness – perspective and application of transactional analysis.

**UNIT- IV ORGANIZATIONAL DEVELOPMENT:**

Concept, characteristics – objectives process/phases, theory and practice, quality circles; organizational change: process, resistance to change, planning and implementation & theories of change.

**UNIT- V ORGANIZATIONAL INTERVENTIONS:**

Concept, purpose and importance, Process of OD interventions – types: Behavioral Techniques, Non-Behavioral Techniques & Miscellaneous Techniques; Strategic intervention: integrated strategic change, organizational design, cultural change.

## UNIT-VI CURRENT CONTOURS (For continuous internal assessment only)

**Self-Study :Talent management and employee relations &OD of your field work.**

### REFERENCE:

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10. Edgar, Schein.,*Organisational Psychology*, Englewood Cliffs New Jersey, Prentice Hall, 1970.
11. [Handbook for Strategic HR: Best Practices in Organization Development from the OD Network \(ODNetwork \(Editor\), John Vogelsang \(Editor\), Maya Townsend \(Editor\)\)](#)
12. [Best Practices in Organization Development and Change: Culture, Leadership, Retention, Performance Coaching \(Louis Carter, David Giber, Marshall Goldsmith, Richard F. Beckhard, W. Warner Burke, Edward E. Lawler III, Beverly L. Kaye, Jay Alden Conger, John Sullivan\)](#)

### E-BOOKS/E-MATERIALS:

<https://open.lib.umn.edu/organizationalbehavior/>  
[http://www.tmv.edu.in/pdf/Distance\\_education/BCA%20Books/BCA%20VI%20SEM/BCA-629%20OB.pdf](http://www.tmv.edu.in/pdf/Distance_education/BCA%20Books/BCA%20VI%20SEM/BCA-629%20OB.pdf)

### COURSE OUTCOME:

- To analyze and compare different models used to explain individual behaviour related to motivation and rewards.
- To identify the processes used in developing communication and resolving conflicts.
- To explain group dynamics and demonstrate skills required for working in groups (team building)
- Students will be able to demonstrate how to make better decisions both individually and, in a group,
- Students will be able to determine appropriate leadership styles to use in particular situations.



<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>
<b>CO1</b>	2	3	2	3	1	1
<b>CO2</b>	3	2	1	2	2	1
<b>CO3</b>	1	3	2	3	1	3
<b>CO4</b>	2	2	1	3	1	2
<b>CO 5</b>	3	2	2	1	2	3
Optimum point	3	3	2	3	1	3

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## **PROGRAMME OUTCOMES:**

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## PROGRAMME-SPECIFIC OUTCOMES:

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**Second Year**

**ELECTIVE COURSE-III  
SPECIALISATION- III  
C. COMMUNITY HEALTH**

**Semester-III**

**Code:**

**(Theory)**

**Credit: 3**

**COURSE OBJECTIVES:**

- To inform the students about health and hygiene and related aspects.
- To enlighten the students about diseases and occupational health.
- To teach students about the health care delivery system.
- To make the students aware of health education.
- To inform students about health work in the community.

**UNIT –I:**

Health and Hygiene: Health, Primary Health Care and Public Health; Concepts and definition, factors influencing health; Social and Preventive Medicine, Levels of disease prevention, comprehensive health indicators – vital health statistics; Community Mental Health and Community Psychiatry. Nutrition and Health: Nutrient Groups: Functions, sources and requirement; Caloric requirements for different age groups; Balanced diet, Malnutrition, Deficiency diseases, prevention of Nutrition problems. Hygiene: Personal, food and Environmental hygiene; Relationship between health and hygiene; Environmental pollution; Living conditions: housing, sanitation, waste disposal and their influence on health.

**UNIT –II:**

Diseases and Occupational Health: Major Communicable diseases: Symptoms, Etiology, Transmission, Prevention and Treatment of : Leprosy, Tuberculosis, STD, HIV, Polio, Malaria, Cholera and Typhoid. Immunisation schedule for children, COVID-19. Major Non-communicable diseases: Cancer, Diabetes, Hypertension, Asthma, Cardiac disorders. Occupational Health: Occupational Health hazards, Common Occupational diseases.

**UNIT –III:**

Health care delivery system: Mental Hygiene movements, trends in Community Mental Health, Public health model of mental health prevention and promotion. School Health: Helping teachers identify problems of physical and mental health, making appropriate referrals, involving and motivating teachers and children; Involvement of Voluntary Agencies. Health care delivery system at the National and State levels, primary health centre, models of community health. Salient features of legislations related to health: MTP ACT (Amendment), 2002, Mental Health Act 1987, Mental Health Care Act 2017. Factories Act 1949, ESI Act 1948; Allocation for Health care in IX Five Year Plan; Health Policies 2003

#### **UNIT –IV:**

Health Education: Meaning and importance, Principles of health education, Techniques and strategies for various community groups, Family Planning: Importance and Techniques; Use of Audio- Visual Aids and Mass Media; First Aid: Concept and methods of dealing with victims of accidents and health education in hospital and rural/slum/ tribal areas.

#### **UNIT –V:**

Health work in the community: Major health problems related to women and children; Socio-cultural practices, beliefs and myths influencing community health; Assessing community health needs, Mobilising core groups; community participation: Principles and practice of Community Participation, Training of multi-purpose workers in community health programmes Social Work Intervention in relation to: Immunisation, nutrition, family planning, maternal and child health, environmental issues (hygiene, pollution and sanitation), accident prevention, suicide prevention, COVID 19 Post Pandemic period, alcoholism and drug abuse prevention.

#### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment Only )**

Students are expected to know the following areas:- Management of community health services, Assessment and situational analysis of community health, Organization and implementation of community health services, Primary Health Care, Supportive supervision, Referral services, Waste management and Health promotion and education.

#### **REFERENCES:**

1. Adelson D. &Kalis L.B. : Community psychology and mental health - perspectives and challenges, chandler Pub., 1970.
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### **COURSE OUTCOMES:**

- Students will be abreast with the health and hygiene practices.
- Students will get to know the various diseases and occupational health prevailing in India and abroad by selecting this course.
- Students will come to know the legal aspects of health.
- Students can update themselves with various health education systems.

<b>PO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>
<b>CO1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>
<b>CO2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>
<b>CO3</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>
<b>CO4</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>
Optimum point	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>

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- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served



**Second Year**

**CORE COURSE-X  
SPECIALISATION -IV**

**Semester-IV**

**A. URBAN COMMUNITY DEVELOPMENT**

**Code:**

**(Theory)**

**Credit:5**

**COURSE OBJECTIVES:**

- To enable students to understand the unique nature of urban communities.
- To develop sensitivity and communication for working with the urban poor.
- To provide knowledge on the government and voluntary efforts towards urban development.
- To equip students with specific skills and techniques for working with urban communities.

**UNIT-I URBAN COMMUNITY:**

Meaning, characteristics, rural urban linkages and contrast; city - meaning, classification, trends in urbanisation process., Theories of Urbanisation. Urban -Definition, History, Characteristics and Theories of Urbanisation. Related concepts: Corporation, Municipality, Town, City, Metropolis, Megapolis, Suburbs, Satellite Town, Smart Cities, Hinterland, Agglomeration, and Urbanism. Urban Evolution, Pseudo Urbanisation. The demographic and Land Use pattern in Urban areas. City Hinterland relationship. Urban Services and Deficiencies: Solid Waste Management, Water Management, Provisions of Urban Amenities, Urban Natural Resources, Encroachment. Slums-Definition, Approaches, Theories and Classification

**UNIT-II URBAN PROBLEMS IN INDIA:**

Population Density, Housing, Drug addiction, Prostitution, Noise, Air and Water Pollution, Environmental issues, Urban Public Health, Urban informal sector, Trafficking and Delinquency. Sub urban issues and problems. Urban Poor, Migration, Eviction, Resettlement and adaptability.

**UNIT-III URBAN COMMUNITY DEVELOPMENT:**

Definition, concept, objectives, Scope and Models, historical background; approaches, principles, process and methods of urban community development, welfare extension projects of central social welfare board, urban development planning: legislation related to urban development: urban land ceiling act, town and country planning act, Nagarpalika act and Tamil Nadu slum clearance and improvement act) community planning, and community participation. Trends in Town and Country Planning Emerging patterns of urban social stratification in India, Early Development Interventions: SPARK Mumbai, People project of Action Aid, Oxfam – Urban Project, Unorganized Workers’ Federation, National Domestic Workers movement, National Slum Dwellers Federation

#### **UNIT-IV URBAN DEVELOPMENT ADMINISTRATION:**

National, State and local levels; structure and functions of urban development agencies: urban services and urban deficiencies; metropolitan development authorities, Housing and Urban Development Corporation (HUDCO) and United Nations Centre for Human Settlement (UNCHS); Housing board, Role of voluntary agencies in urban development.

Urban Municipal Administration- structure, composition, functions and current issues. Democratic functioning of Urban local bodies, 74th Constitutional Amendment, Governance and citizen's participation. E-Governance in Urban Development, National Urban Information System (NUIS).

#### **UNIT-V URBAN DEVELOPMENT PROGRAMMES:**

Five-year plans/NITI Aagoy and urban development, Urban development Policy, Madras Urban Development Projects (MUDP) I & II; Tamil Nadu Urban Development Project (TNUDP); Urban Basic Services Programmes (UBSP), Nehru RozgarYojana (NRY), etc. Tamil Nadu Slum Area (clearance and improvement) Act 1971, and problems in implementation of urban community development programmes; role of development worker – application of social work methods in urban development.

Housing for the urban poor – policy and practice in developing countries. Major National Missions: JNNURM (AMRUT), AtmaNirbhar Bharat, Smart Cities, Swachh Bharat Mission, HRIDAY, DeendayalAntyodayaYojana National Urban Livelihoods Mission, Atal Mission for Rejuvenation and Urban Transformation -AMRUT, Housing for all 2022. Institutions and government departments: CMDA, TNHB, TNSCB, CMWSSB. Commissionaarte for Town and Country Planning. Urban training Institutions: TNIUS, NIUA. Role and Skills of Community Development Worker in Urban Community Development. Mechanisms to address Urban Social concerns: Women helpline, Child helpline.

#### **UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Undertake Social Survey in Urban Slum to understand practical difficulties of Urban People

#### **REFERENCES:**

1. Mitra, Arup. Urbanisation, slums, informal sector employment, and poverty: An exploratory study. BR Publishing Corporation, 1994.
2. Ramachandran, Ranganathan. "Urbanization and urban systems in India." OUP Catalogue (1992).
2. Thudipara, Jacob Z. Urban Community Development. Rawat, 2007.
3. Vibhooti, Shukla. "Urban Development and Regional policies in India." Himalaya pub., Bombay (1988).
4. Diddee, Jaymala, and VimlaRangaswamy. "Urbanisation: trends perspectives and challenges." (1993).
5. Gerald Breeze, 1996 Urbanization in newly developing countries, Prentice Hall Inc. London,
6. Jacob Z. Thudipara, 1993 Urban Community Development, Rawat Publishers, NewDelhi.

7. JayamalaDiddee&Rangasamy, N, 1993 Urbanisation Trends, Perspectives & Challenges, Rawat Publications, Jaipur
8. SatishSinha, 1995 Slum Eradication & Urban Renewal, Inter- Publications, New Delhi
9. Sharma C.L., 1992 Urban Power Structure; Shiva Publications, Udaipur.

**COURSE OUTCOMES:**

**Upon successful completion of this course the students would be able:**

- To describe the basic aspects of Urban Community Development.
- To have familiarity with institutions related to Urban Communities.
- To Classify the needs & significance of Urban Community Development.
- To Examine the policies & programmes related to Urban Community Development.
- To analyze the administration and governance of Urban Community Development.

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO7
CO1	1	3	2	2	1	2	2
CO2	2	3	3	3	2	3	1
CO3	1	3	3	3	3	2	3
CO4	1	3	3	3	2	1	1
CO5	1	2	2	2	1	2	1
Optimum point	1	3	3	3	2	2	1

K1= Low, K2= Moderate, K3= Substantial



## PROGRAMME OUTCOMES:

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**Second Year**

**CORE COURSE-X  
SPECIALISATION -IV**

**Semester-IV**

**B. LABOUR WELFARE AND LABOUR  
LEGISLATION**

**Code:**

**(Theory)**

**Credit:5**

**COURSE OBJECTIVES:**

- To impart the issue of labour welfare.
- To inform students about the different laws for employment, welfare wage, and salary procedure in an Industry.
- To enlighten students about social security legislation.
- To highlight the issue of industrial conflict.

**UNIT -I :**

Labour welfare: concept, scope, principles, theories, origin and growth of labour welfare in India; types of welfare; labour problems: absenteeism addiction, indebtedness, family distress and social work intervention; labour welfare programmes: safety, health and hygiene, occupational diseases, crèche, canteen, credit society, worker's education labour welfare officer: status, role, duties and functions; Labour Code– meaning, New labour Rule & Changes in New labour codes.

**UNIT –II:**

Labour legislations in India: Factories Act 1948; the Plantation Labour Act 1951; Indian Mines Act 1952, Apprentices Act 1961; Labour Relations legislation: the Trade Union Act 1926, Tamil Nadu Shops and Establishment Act 1947, Tamil Nadu Industrial Establishment (National and Festival Holidays) Act 1951.the Occupational Safety, Health & Working Conditions Code, 2020. (Only Salient features)

**UNIT- III:**

Employment Legislations: Industrial Dispute Act-1947, The Industrial Employment (Standing Orders) Act-1946, The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act-1979, The Contract Labour (Regulation n and Abolition) Act-1970.The Industrial Relations Code(Only Salient features).

**UNIT –IV:**

Social Security Legislations: Workmen's Compensation Act 1923, Employees' State Insurance Act 1948; Employee's Provident Fund Act 1952, including the Pension Scheme 1995; the Maternity Benefit Act 1961, Payment of Gratuity Act 1972.The Code on Social Security, 2020(Only Salient features)

## **UNIT- V:**

Wage legislations: the Payment of Wages Act, 1936, the Minimum Wages Act 1948, the Payment of Bonus Act 1965, the Equal Remuneration Act, 1976; the Tamil Nadu Payment of Subsistence Allowance Act and case laws. the Code on Wages, 2019(Only Salient features),

## **UNIT- VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Self-Study: Trends of Labour Law Compliance in India,

### **REFERENCES:**

1. Ashdir , Vijay. *Management of Industrial Relations*.Kalyani Publishers, 2003.
2. Bhangoo, Kesar Singh. *Dynamics of industrial relations*.Deep & Deep Publications, 1995.
3. Giri, VarahagiriVenkata. "Labour problems in Indian industry." (1960).
4. I.L.O. *Labour Legislation*.1980
5. Monappa, Arun. "Industrial Relations, Ninth print (1995)."
6. Myers, Charles Andrew, and SubbiahKannappan. *Industrial relations in India*.Asia Publishing House, 1970.
7. Prasad NGK. *Factories Law and Rules applicable to TN State, Vols.I, II, III, IV*.Madras Book Agency. 1978.
8. Saxena, R. C. *Labour Problems and Social Welfare*. Jai PrakashNath, 1963.
9. Srivastava, Suresh C. *Industrial relations and labour laws*.Vikas Publishing House Pvt Ltd, 2007.

### **E-BOOKS/E-MATERIALS:**

<https://publish.pothi.com/preview/?sku=ebook2540>

[https://ebooks.lpude.in/management/mba/term\\_3/DMGT516\\_LABOUR\\_LEGISLATIONS.pdf](https://ebooks.lpude.in/management/mba/term_3/DMGT516_LABOUR_LEGISLATIONS.pdf)

### **COURSE OUTCOMES:**

**On successful completion of the course, the students will be able to**

- Students will abreast of various statutory and non-statutory welfare measures prevailing in Indian Industries.
- Students will be abreast of various labour legislations in India.
- Students will undoubtedly update on legislation on employment.
- Students will certainly know the various legislations on social security and wages.

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	2	1	3	3	2
CO2	3	2	1	2	1	3
CO3	2	2	1	3	1	2
CO4	2	2	2	3	3	3
Optimum point	2	2	1	3	3	3

K1= Low, K2= Moderate, K3= Substantial





## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**Second Year**

**CORE COURSE-X  
SPECIALISATION -IV**

**Semester-IV**

**Code:**

**C. MEDICAL SOCIAL WORK  
(Theory)**

**Credit:5**

**COURSE OBJECTIVES:**

- To introduce the students to the concept of medical social work and related aspects.
- To inform the students about the Psychological, Social and economic implications of illness and disability.
- To enlighten the students about hospital as a formal Organisation.
- To make students aware of Impairment, Disability, and Handicap.
- To highlight the specific needs and problems of patients and their families.

**UNIT –I:**

Medical social work: definition, concept, objectives, its nature, need and scope; the roles and functions of a medical social worker; historical development in India and abroad; medical sociology and its relevance to medical social work practice; practice of social work methods in hospital settings: their need and importance in working with patients and families: scope and limitations of practice.

**UNIT- II:**

Psychological, social and economic implications of illness and disability: for the patient and his family; concepts of patient as a person, patient as a whole, the psychosomatic approach; multidisciplinary teamwork: need, importance, and principles; role of social worker as a member of the team.

**UNIT- III:**

The hospital as a formal mobilization: its goals, technology, structure and functions, departments, administrative procedures, implications of mobilization on for the patient and his family; medical social work department: staffing, mobilization and functions; extension services; public relations.

**UNIT- IV:**

Impairment, Disability and Handicap: causes, types and classification of physical handicaps: orthopedic disability, visual handicap, aural impairment and speech disability; psychosocial problems and implications for each specific handicap and role of the medical social worker in intervention; physical medicine, physiotherapy and occupational therapy: objectives and types; rehabilitation: definition, concept, principles, and process; role of the medical social worker in rehabilitation planning, resource mobilization, and follow-up.

## **UNIT –V:**

Specific needs and problems of patients and their families: need for assistance and role of the medical social worker in the following settings: outpatient unit, intensive care unit, pediatric ward, maternity ward, abortion clinic, family planning centre, std clinic, HIV clinic, orthopedic department, cardiology department, blood bank, TB sanatorium and cancer hospitals, training of the volunteers to work with the chronically ill in the community, and special focus on rural/tribal areas.

## **UNIT –VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Students are expected to organize awareness programmes on the health issues affecting the rural urban and tribal people particularly on Dengue fever, Nipah Virus, Birds Blue, TB, HIV/ AIDS, etc.

## **REFERENCES:**

1. Bartlett, Harriett Moulton. Social work practice in the health field. NatlAssn of Social Workers Pr, 1961.
2. Cannon, Ida Maud. On the social frontier of medicine: Pioneering in medical social service. Harvard University Press, 1952.
3. Codey& Carol H.Social aspects of illness.W.B. Saunders Com., 1951.
4. Field, Minna. “Patients are people.” A Medical Social approach to prolonged illness, (1967).
5. Goldstine, Dora. Expanding horizons in medical social work. University of Chicago Press, 1955
6. Hamilton, Kenneth W. “Counseling the handicapped in the rehabilitation process.” (1950).
7. Hubschman, Lynn. Hospital social work practice. Praeger Publishers, 1983.
8. Pattison, Harry Archibald, ed. The handicapped and their rehabilitation. Thomas, 1957.

## **COURSE OUTCOMES :**

- Upon successful completion of this course, the student should be able to
- Understand the concepts of Medical Social Work
- Awareness of the emerging trends in the field of medical social work
- Apply medical social work practices in clinical settings
- Understand the psychosocial factors that affect the health of individuals
- Classify the different types of disabilities
- Evaluate policies, legislations and programmes related to health and disabilities

PO/ CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	3	3	3	2	1
CO2	1	3	3	3	3	2
CO3	2	3	2	3	3	2
CO4	1	2	2	2	3	1
CO5	1	2	2	3	2	1
CO6	2	3	2	3	3	2
CO7	1	2	2	2	3	1
Optimum point	1	3	2	3	3	1

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
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**Second Year**

**CORE COURSE-XI  
SPECIALISATION -V**

**Semester-IV**

**A. PROJECT MANAGEMENT**

**Code:**

**(Theory)**

**Credit:5**

**COURSE OBJECTIVES :**

- To understand the concepts and techniques in project management
- To know the content of strategic plan.
- To Learn about risk analysis and risk management.
- To understand the different aspects of participatory community development
- To obtain full-fledged knowledge on Tools and Leadership in Project Management.

**UNIT-I:**

Project management –An overview of Concepts and Processes, objectives, Operations, understanding Project, Project life cycle, Activities output, outcome, deliverables, performance indicators and evidence.

**UNIT-II:**

Planning: –Basic steps, strategies and Planning, preparing the pre-planning Stage; Mission and vision statement; SWOC analysis, situation assessment, identification of critical issues; contents of a strategic plan; characteristics of an effective annual operating plan, implementing strategic plan. Objective-oriented planning: Logical Framework Approach; analysis of the project context; stakeholder analysis, problem analysis, objective analysis, resource planning, risk analysis and risk management

**UNIT-III:**

Conceptualizing and Initiating a Project – Setting goals and securing commitment; the project goal, developing goal statements, setting budget goals; time and money. Managing conflicts, creating goal commitment.

**UNIT-IV:**

Work Breakdown Structure, Scheduling Tools; Gantt Charts; PERT/CPM Networks; Project Control purpose, processes, periodic control techniques, periodic control techniques, cost control, monitoring, midterm evaluation and end-term evaluation, providing components and indicators for evaluations. Project completion and review; improving project performance, steps for project completion, learning before doing, learning after doing, carrying out reviews



## **UNIT-V:**

Leadership in Project Management: Essential Characteristics of a good project leader, managing teams in projects, training for staff in social welfare projects, training for staff in social welfare projects; essential Characteristics of effective communication; public relations Techniques of Fund Raising, Foreign Contribution Regulation Act, Case Presentations on successful proposal

## **UNIT-VI      CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Preparing project proposal for funding organization

## **REFERENCES:**

1. SathyaNarayana M, & Lalitha Raman, Management Operations Research, HimalayaPublications, Bombay, 1988
2. Chandra Prasanna, Project Preparation, Appraisal, Budgetting and Implementation, Tata Mcgraw Hills, New Delhi, 1986
3. Casley D.J & Wury D.A., Monitoring and Evaluation of Agriculture and RuralDevelopment Projects, John Hopkins, Baltimore, 1982
4. Wayne , Mondy R. Holmes Robert E. & Edwin Flippo, Management Concept andPractices, Second Edition, Allyn and Bacon Inc., Boston, 1983
5. Ghattas and Sandra L McKee. (2008) Practical Project Management. New Delhi, Pearson Education.
6. Mishra S.N., Rural Development Planning – Design and Method, Satvaan Pub., NewDelhi, 1984.
7. Gray CF et al. (2000) Project Management: The Managerial Process. Boston, McGrawHill.
8. Stoner James A.F. & Charles Wankel, Management Third Ed., Prentice Hall, NewDelhi, 1988.
9. Taha Hamby A., Operation Research – An Introduction Third Ed. McMillion, New York, 1982.
10. Jerome Wiesf D. & Ferdinand Levy K., Management Guide to PERT / CPM, PrenticeHall, New Delhi, 1988.

## **COURSE OUTCOMES:**

**upon successful completion of this course the students would be able:**

- To understand about projects.
- To explain project planning.
- To familiarize with project management tools.
- To have clarity on project evaluation and completion.
- To have deep knowledge on good project.

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	3	3	3	2	1
CO2	1	2	2	2	1	1
CO3	1	2	2	2	1	1
CO4	1	2	3	3	2	1
CO5	2	3	3	3	2	1
Optimum point	1	2	3	3	2	1

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
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- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**B. EMPLOYEE RELATIONS AND TRADE  
UNION**

**Code:**

**(Theory)**

**Credit:5**

**COURSE OBJECTIVES:**

- To teach the students on global as well as local perspective on industrial relations
- To understand the practices of industrial relations at all level.
- To know the need for enhancing appropriate skills to be acquired in promoting healthy industrial relations

**UNIT –I:**

Industrial Relations Definition, Meaning of Industrial Relations, Characteristics of a Good Industrial Relations System- Changing Profile of Industrial Workers–Labour in Constitution– Administration of Labour Department, Theories of IR, IR in Multi-National Companies.

**UNIT- II:**

ILO – History, Aims, Objectives, Structure and Functions, Social Security Measures, Achievements, Influence of ILO on Indian Industrial Relations –Industrial Relations and Labour Practices in India.

**UNIT- III :**

Trade Unionism – History, Objectives, Problems Faced, Recognition – Trade Union Movement in India – Employer Federation, Collective Bargaining: Methods, Issues, Problem and Settlement.

**UNIT –IV:**

Industrial Conflict: Industrial Conflict: Types, Causes, Consequences, Standing Orders, Industrial Disputes, Settlement Mechanisms, Industrial Peace and Harmony, Grievance, Discipline, Domestic Enquiry–Recent Trends. Workers Participation in Management.

**UNIT –V:**

Social Aspects in Industries: Social Responsibility of Industrial Organization, Evolution, Philosophy, Principles of CSR Developmental Projects- Goals and Implementation. Critical Analysis of CSR Approach. Roles of Social Workers/HR Professionals in Helping Industry to Discharge its Social Obligations, Ethical Aspects in CSR Projects, Social Auditing.

## UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only)

Self-Study: Legal aspects of Employee relations and understanding the local Trade Unionism

### REFERENCES:

- Srivastava, 'Industrial Relations and Labour Laws' (2<sup>nd</sup>) Vikas Publishing House Pvt. Ltd., 2002.
- Vijay Ashdir, "Management of Industrial Relations" (2<sup>nd</sup>) Kalyani Publishers, 2003.
- Arun Monappa, 'INDUSTRIAL RELATIONS', S. Chand Co., 1989.
- Kesarsingh Bhangoo, Dynamics of Industrial Relations, Deep Publications, 2004.
- Sharma A.M., 'Industrial Relations' and Conceptual, Legal Frame Work', Himalaya Publishing House, Bombay, 1989.

### E-BOOKS/E-MATERIALS:

1. <https://bookauthority.org/books/best-industrial-relations-books>
2. [https://www.academia.edu/29213079/Industrial\\_Relations\\_Book](https://www.academia.edu/29213079/Industrial_Relations_Book)
3. <https://slideplayer.com/slide/9764633/>

### COURSE OUTCOME:

- To familiarize with the role of management and unions in the promotions of industrial relations.
- Examine the labour relation issues and its management.
- To acquire skills in handling employer-employee relations.

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO7
CO1	1	2	2	2	2	1	2
CO2	2	2	2	2	2	2	2
CO3	2	3	3	3	2	1	1
Optimum point	2	2	2	2	2	1	2

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

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- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

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**C. PSYCHIATRIC SOCIAL WORK**

**Code:**

**(Theory)**

**Credit:5**

**COURSE OBJECTIVES :**

- To introduce the students to the concept of psychiatric social work.
- To highlight the historical development of psychiatric social work.
- To make students aware about psychiatric illnesses.
- To throw light on therapeutic intervention in psychiatric illness.
- To inform students about the scope of psychiatric social work practice.

**Suggested Teaching / Learning Methodology**

Lectures, PPT, Discussion, Small Group Exercises, Brain Storming, Mini Survey  
Assignment, Seminar, Group/Mini Project, Filed / Observation Visits  
Invited guest speakers / practitioner - discussion and interaction

**UNIT –I:**

Psychiatric Social Work: definition and concept, historical development in India and abroad; current status as a field of specialization.; case work, group work, and community organisation in the psychiatric services; limitations and difficulties faced in psychiatric social work practice; psychiatric epidemiologist in India.

**UNIT- II:**

Historical development of Psychiatry as a Field of Specialisation: attitudes and beliefs pertaining to mental illness in ancient, medieval and modern times; concepts of normality, abnormality and mental health; classification of mental illness: Diagnostic Statistical Manual-V(DSM): International classification of diseases (ICD); psychiatric assessment: interviewing, case history taking; sources of intake, mental status examination; formulation of psychosocial diagnosis.

**UNIT –III:**

Psychiatric Illness: neuroses, psychoses, organic and functional, culture-bound syndromes, personality disorders, sexual deviations, alcoholism and drug dependence; mental handicap: definition, classification, clinical types and causes, Cerebral palsy: clinical types, causes, associated disabilities; epilepsy: definition, types, causes, management; ageing: biological, social and psychological problems; suicide: causes, indications, prevention; childhood disorders: behaviour disorders; eating, elimination, sleep and speech disorders; childhood psychoses: autism, schizophrenia; scholastic backwardness: symptoms, causes and management; attention deficit disorders

#### **UNIT –IV:**

Therapeutic Intervention in Psychiatric Illness: psycho education, cognitive therapy, group psychotherapy, family therapy, marital therapy: scope and types; behaviour therapy: principles and techniques, ECT, chemotherapy, psychosurgery and mega vitamin therapy; occupational therapy (purpose and concept).

#### **UNIT –V:**

Scope of Psychiatric Social Work practice: roles and functions of a psychiatric social worker with regards to the problems of patients and their families in:

Psychiatric OPD'S 2) psychiatric speciality clinics 3) de-addiction centres, 4) child guidance clinics; rehabilitation of psychiatric patients: role of the social worker in rehabilitation - planning, mobilization, reintegration of the patient in the family and community; principles and models of psychiatric rehabilitation; role of the psychiatric social worker in team work. concepts of : therapeutic community, partial hospitalization, daycare centers, halfway homes, sheltered workshop and transitory homes; national mental health programme; district mental health programme.

#### **UNIT-VI      CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Students are expected to organize awareness programmes on the mental health issues affecting the rural urban and tribal people particularly on mental illness. Special attention may be given to school / student's mental health issues, suicide prevention, etc

#### **REFERENCES:**

1. Carson, Robert C., James N. Butcher, and James C. Coleman. Abnormal psychology and modern life . Scott, Foresman& Co, 1988.
2. Denzin, Norman K. Treating alcoholism: An alcoholics anonymous approach. Vol. 46. Sage Publications, Inc, 1987.
3. Dickerson, Martha Ufford. Social work practice with the mentally retarded. Free Pr, 1981. Hudson, Barbara L., and Raghu N. Gaiind.Current Themes in Psychiatry.Macmillan, 1978.
4. Hughes, Jennifer, and Jennifer Barraclough. An outline of modern psychiatry.John Wiley & Sons, 1986.
5. John, Howells G. Modern perspectives in international Child psychiatry, Brunner & Mazel Pub.1971.
6. Kraepelin, Emil. Psychiatry: A Textbook for Students and Physicians. General Psychiatry. Ed. Jacques M. Quen.Science History Publications, 1990.
7. Marfatia, JayantChhotalal. Psychiatric problems of children.Popular Prakashan, 1963.
8. NunnallyJr, Jum C. "Popular conceptions of mental health: Their development and change." (1961).
9. Paul, Gordon L., and Robert J. Lentz. Psychosocial treatment of chronic mental patients: Milieu versus social-learning programs. Harvard University Press, 1977
10. Roberts, Nesta. "Mental health and mental illness."Mental health and mental illness. (1967).
11. Singh, HarGopal. Psychotherapy in India: From Vedic to modern times. No. 3.National Psychological Corporation, 1977.

12. Verma, Ratna. Psychiatric social work in India. SAGE Publications Pvt. Limited, 1992.  
 13. Walrond-Skinner, Sue, ed. Developments in family therapy: Theories and applications since 1948. Routledge, 1981.  
 14. Wolberg, Lewis Robert. Handbook of short-term psychotherapy. Thieme-Stratton, 1980.

**COURSE OUTCOMES :**

**upon successful completion of this course, the student should be able to**

- Describe the evolution of psychiatric social work in India and abroad
- Know the recent developments in the field of Psychiatric social work
- Acquire knowledge and indigenous practice of mental health
- Identify symptoms, causes of various mental disorder
- Apply therapeutic intervention for Psychiatric illness
- Know about the role of psychiatric social worker in rehabilitation of mentally ill people
- Apply social work methods and techniques in psychiatric settings

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	3	3	3	1	1
CO2	1	3	3	3	1	1
CO3	1	2	2	3	3	2
CO4	2	3	3	3	2	1
CO5	1	3	3	3	3	1
CO6	1	3	3	3	2	1
CO7	1	2	2	3	3	2
Optimum point	1	3	3	3	3	1

K1= Low, K2= Moderate, K3= Substantial



## **PROGRAMME OUTCOMES:**

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- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

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Second Year

ENTREPRENEURSHIP /

Semester-IV

**INDUSTRY BASED COURSE**

**CONCURRENT FIELDWORK PRACTICE**

**Code:**

**(Theory)**

**Credit:5**

**COURSE OBJECTIVES:**

- The main objectives of this course are to:
- Facilitate Social Work Trainees and be exposed on social issues related to their fields of specialization.
- Gain Knowledge on Social Work Practice in Professional Social Welfare Agencies/Beneficiary Organizations.
- Develop a practical understanding needs/challenges of people in their fieldwork agencies
- Apply social work methods and techniques in their field of specialization
- Uphold the Ethics and Values of the Social Work Profession in their fields of specialization

**A. STANDARD OPERATING PROCEDURES (SOPS)**

- a. **Timing** The Social Work Trainees are expected to strictly adhere to the official working hours of the Agency and be punctual. They should report to the agency on-time.
- b. **Availability:** The trainee should report and work on the timings of the agency regularly, except on the days that are mentioned in the covering letter and be available throughout the agency's official working hours. However, if the agency requires the service of the trainee they can be called on holiday too.
- c. **Required Number of Days and Hours:** The trainees are expected to fulfill a minimum of 30 days which may be for a duration of 8 to 12 weeks on concurrent basis where the trainees are expected to report on Tuesdays, Thursdays and Saturdays.
- d. **Dress Code :** Only formal dress will be allowed
- e. **Attendance:** 100% attendance in field work is compulsory for successful completion and getting pass. Trainee should report and work on the timings of the agency regularly, as mentioned in the covering letter addressed to the Agency in this regard. However, if the agency requires the service of the trainee they can be called on holidays

**B. Reporting and Documentation:** Activities of the trainee must be recorded in concurrent reports and have to be consolidated towards the end of fieldwork of which a copy has to be submitted to the agency.

**C. Mentoring & Guidance by the Agency Supervisor:** The Agencies would a staff or an administrators to be the Trainee's supervisor. The agency supervisor would Supervise the Trainees in their fieldwork, overseeing the entire range of field experience., Ensure trainee's activities are meeting field education objectives., Maintain regular contact with the Trainee and other agency supervisors involved in the internship., Formally meet with the Trainee at least 30 minutes a day to monitor the trainee's progress and suggest and Approve the activities of the Trainee by signing the duly filled-in 'Time Sheet' available with the trainee

D. **Individual Conference with the Faculty Advisor:** The trainee will be provided with timer for an individual conference on all Mondays, Wednesdays and Fridays. The time to be provide is about an hour. They are expected to submit written record of work done and the faculty supervisor is expected to enter comments prior to the conference.

**E. FIELD WORK REPORT**

Fieldwork report is a crucial aspect of social work field practice. The template could follow the following sequence: the purpose of the visit, observation, content, impression, worker’s role, and next plan of action.

- F) **Purpose of the visit:** The social work trainee is expected to state his / her mission, intention or aim of visiting the agency.
- g) **Observation:** The student social work trainee is expected to give an account of all that is around him in the agency that has a direct or indirect bearing with the object/subject of intervention. The scope of inference must be problem-specific.
- h) **Content:** All that transpired between the student and his client/ employee/ member of the Community in the course of the intervention, constitutes the content.
- i) **Impression:** This is a subjective expression of the student trainee’s goal assessment. The student trainee is at liberty to state his feelings, cognitive judgment, and general expectations with regards to his client/employee /member of the Community and the overall intervention process.
- j) **Trainee’s role:** The trainee is expected to describe all the skills, methods/techniques he or she adopted in the intervention process.
- k) **Next plan of action:** The student trainee is expected to state what will become his next line of action or better still, what he/she intends to do in the next fieldwork schedule.

Evaluation (Concurrent Field Work for Semester IV )

Evaluation: Internal : 40 marks

- 1. Case Work/Case study Practice/ Need Analysis Survey - 10 marks
  - 2. Group Work/PRA/ SWOC/ Mini Research/ - 10 marks
  - 3. Awareness Programme/ Contribution to the Agency - 10 marks
  - 4. Understanding the Agency and its Functional services - 5 marks
  - 5. Reporting /Attendance for field work - 5 marks
- 40 marks  
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External (60 marks)

- 1. Understanding of the agency and its services - 20 marks
  - 2. Theoretical Knowledge/ Practice Skills - 20 marks
  - 3. Mobilising Resources/ Attendance for field work - 10 marks
  - 4. Communication and Presentation - 10 marks
-

**COURSE OUTCOME**

After successful completion of this course, the Social work trainees will be able to attend the the following tasks in an enhanced professional manner:

- Increase the coping capacity of all clients by effectively utilizing the problem-solving model.
- Participate fully in contribution to the modification/formulation of various social policies or influencing most social policies from its formative stage.
- Create awareness by educating, advocating, and concentrating on conscientizing the society to effectively utilise available human and materials resources.
- Harmonizing human relationships in their physical and social environments through rehabilitation, reconciliation, and re-integration, where and when necessary.
- Help in rural transformation by making rural life more meaningful to the people through helping them to achieve self-reliance.

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	3	3	3	1	1
CO2	2	3	3	3	2	1
CO3	1	2	3	3	1	2
CO4	3	3	3	3	2	1
CO5	3	3	3	3	1	1
Optimum point	3	3	3	3	1	1

K1= Low, K2= Moderate, K3= Substantial





## PROGRAMME OUTCOMES:

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**Second Year**

**PROJECT**

**Semester-IV**

**Code:**

**Credit:5**

### **COURSE OBJECTIVES:**

**The overall objectives of the research project work is to make the trainees to**

- Identify the pertinent research Problems.
- Collect, refer the earlier reviews and Find out the research gaps.
- Generate and infer hypothesis for the research problems.
- Learn the art of writing the research methodology chapter.
- Convert the collected verbal data into numerical for the purpose of statistical analysis and interpretation.
- Test the hypothesis and summarize the major findings, suggestion and conclusion.
- Compile the research report

Social Work trainees are required to undertake a social work research on any social issue of concern. Scientific research process is mandatory. Either inductive or deductive research studies could be pursued.

Chapterization for the research project comprises an Introduction, Literature Review, Research Methodology, Results and Discussion. Social work research, otherwise termed as evidence based research, emphasises implications for social work interventions.

Social Work trainees should prepare and submit a dissertation under the guidance of a faculty. The learner is to engage meaningfully in the process of problem formulation, review of literature related to the study, preparing the research proposal, choosing an appropriate research strategy and developing instruments of data collection, collecting the data, processing, analysing and interpreting the data and preparing the research report. The length of the research report may be between 60-75 pages and not exceeding 100 pages

Each candidate shall be required to take up a Project Work and submit it at the end of the final year. The Head of the Department shall assign the Guide who, in turn, will suggest the Project Work to the student in the beginning of the final year. A copy of the Project Report will be submitted to the University through the Head of the Department on or before the date fixed by the University.

The Project will be evaluated by an internal and an external examiner nominated by the University. The candidate concerned will have to defend his/her Project through a Viva-voce.

## ASSESSMENT /EVALUATION /VIVA-VOCE:

### 1. PROJECT REPORT EVALUATION (Both Internal & External):

- |  |            |
|--|------------|
| I. Plan of the Project   | - 20 marks |
| II. Execution of the Plan/collection of Data / Organisation of Materials / Hypothesis, Testing etc and presentation of the report. | - 45 marks |
| III. Individual initiative   | - 15 marks |

### 2. VIVA-VOCE / INTERNAL& EXTERNAL - 20 marks

**TOTAL - 100 marks**

### PASSING MINIMUM:

Project	Vivo-Voce 20 Marks 40% out of 20 Marks (i.e. 8 Marks)	Dissertation 80 Marks 40% out of 80 marks(i.e. 32 marks)
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A candidate shall be declared to have passed in the Project work if he/she gets not less than 40% in each of the Project Report and Viva-voce but not less than 50% in the aggregate of both the marks for Project Report and Viva-voce.

A candidate who gets less than 40% in the Project must resubmit the Project Report. Such candidates need to defend the resubmitted Project at the Viva-voce within a month. A maximum of 2 chances will be given to the candidate.

### COURSE OUTCOME

After successful completion of this course, the Social work researchers will be able to perform the following tasks in an enhanced professional manner:

- Increase in the knowledge on doing social work research.
- Suggest solutions to the identified problems among the targeted despondence.
- Support the Non-governmental Organizations/ Governmental departments in undertaking various social policies or influencing most social policies based researches.
- Publish articles in the books and journals.
- Help in rural transformation by making rural life more meaningful to the people through helping them to achieve self-reliance and happy.

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	3	3	3	1	1
CO2	2	3	3	3	2	1
CO3	1	2	3	3	1	2
CO4	3	3	3	3	2	1
CO5	3	3	3	3	1	1
Optimum point	3	3	3	3	1	1

K1= Low, K2= Moderate, K3= Substantial



## PROGRAMME OUTCOMES:

- **Values and Ethics:** Students will be able to understand the concept, apply values, ethical principles, and knowledge of human behaviour, and develop critical thinking to inform and communicate professional judgments and the social environment to guide professional practice, professional competence and accountability, and identify as a professional social worker and conduct oneself accordingly
- **Social Work Knowledge:** Students will be able to draw on knowledge related to social conditions and problems, understanding human beings, social policies and programs, social phenomena, research, the social work profession, and various practice theories to facilitate the process of change and to transform that knowledge into action.
- **Social Work Skills:** Students will be able to use theory and research to enhance practice, communication, listening and assessment skills, basic interviewing skills, provide help, direction and guidance, empowerment, negotiation skills, assessment skills, communication skills, advocacy and leadership, problem-solving skills, critical thinking skills, respect for diversity, intervention skills, organizational skills recording and documentation skills, understanding of human relationships, problem-solving skills in finding solutions for individuals, groups and communities in addition to skills in work with limited resources and tight budgets, and be able to evaluate practice with individuals, families, groups, organisations and communities.
- **Social work practice:** Perform as professional social workers in advanced direct practice with individuals, families, groups, and organisations.
- **Conduct Social work research:** engage in scientific inquiry and evidence-based practice on social issues and problems, identify, formulate, review of research literature, and analyse complex individual, group, organisation and community problems based on research-based knowledge and methods, including design, analysis and interpretation of data, and synthesis of the information to reach substantiated conclusions using social work knowledge, and engage in research-informed practice and practice-informed research
- **Human Rights and Human values:** Enhance an understanding of human rights, human and community well-being, social, economic and environmental justice, and engage in policy practice

## PROGRAMME-SPECIFIC OUTCOMES:

Upon successful completion of the **Master of Social Work Program** the students can:

- Identify oneself as a professional social worker and conduct oneself accordingly by applying social work values and ethical principles to guide professional practice and develop a strong foundation of theoretical knowledge of Social Work and generate purposive and progressive ideas through the application of the knowledge, aptitude, and skills in the field of Social Work.
- Analyse causes and consequences of social problems at the individual, family, community and societal levels, and evolve appropriate intervention strategy/schemes for amicable solving and prevention besides formulating, advocating, and assessing the impact of relevant social policies that advance social well-being.
- Understand human behaviour in the social environment and apply it to guide the processes of assessment, intervention, and evaluation of social dynamics and apply the knowledge gained in the process to understand the individual and social environment and provide counselling to individuals, families, groups, etc.
- Perform successfully in the chosen careers that require Social Work knowledge, aptitude and skills and gain sufficient self-awareness to eliminate the influence of personal biases and values in working with diverse groups and understand the forms and mechanisms of oppression and discrimination and deal with them appropriately.
- Develop social work skills and use tools of Social Work to solve individual, family, group or community problems and perform tasks in Social Welfare Organisations (Government/Voluntary Agencies, Academic/Research/Clinical/ Industrial Concerns, Correctional Institutions, Communities and the like) by adapting various Intervention Techniques like **Supportive Techniques, Reflective Performance and Direct Influence** and use appropriate verbal and written communication in community/ agency setting with clients, staff and community stakeholders.
- Develop skills to float and administer a voluntary service organization and administer social welfare organisations and perform the tasks of Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting (POSDCORB) with good social, communication, and interpersonal skills

Engage in research on psycho-social problems/issues affecting individuals, families, groups, organisations, communities, etc., by adopting scientific research methodology and using research evidence to address the issue at hand, conduct social impact assessment surveys and evaluation of projects and prepare, use and maintain of records as positions held and institutions served

**Second Year**

**VALUE ADDED COURSE-II**

**Semester-IV**

**Code:**

**HUMAN RIGHTS  
(Theory)**

**Credit:2**

**COURSE OBJECTIVES:**

- To sensitize students about the basic concepts of human rights.
- To know about the functional aspects of human rights.
- To sensitize about the issues of human rights.
- To give knowledge about the application of human rights in the field of social work.

**UNIT – I:**

Human Rights - Meaning, Concept, Classification of rights: Moral rights, Legal rights, Civil rights, political rights and Human rights issues

**UNIT – II:**

Human rights concern- The UN Declaration of Human rights, Fundamental Rights and Duties under the Indian Constitution, Directive Principles of State Policy.

**UNIT- III:**

Rights of Vulnerable groups: Children rights, Women, aged, victims of caste and communal conflicts, human rights for indigenous people, Rights of people living with disabilities, rights of HIV/AIDS infected persons. Housing rights and rights of prisoners

**UNIT -IV :**

Human rights commission in India: Administrative structure, functions, power, inquiry procedure and steps, investigations. State commissions and human rights courts.

**UNIT – V:**

Illustrate cases on violation of Human rights. Public interest Litigation (PIL), Legal aid, Protection of Human Rights Act 1993

**UNIT -VI CURRENT CONTOURS ( For Continuous Internal Assessment Only)**

Students are expected to document and critically analyses the day-to-day human rights issues appeared in daily newspapers and present it in class room seminars.



## REFERENCES:

1. Tafan,B. (2003) Social Work and Human Rights: New Delhi: Rawat
2. Hobhouse L.T. (1922) Elements of Social Justice, London: Allen and Unwin
3. Jagannadhan.V(1978)Administration and Social Change, New Delhi. Uppal
4. Malhotra.M (ed) (1992) Anthropology Development, Mittal Publications, New Delhi
5. ParamahansaV.P.K(1984) Rural Transformation Readings, Hyderabad
6. Richard B. Brandt (Ed) (1962)Social Justice, Prentice HallInc, N J 1962
7. Varma(1980)Reservation, India Law and The Constitution, Allahabad: Chugh

## COURSE OUTCOMES

Upon successful completion of this course, the student should be able to

- Understand the basic concepts of human rights
- Know the fundamental rights and UN Declaration of Human rights
- Know the vulnerable groups
- Know public interest Litigation (PIL), Legal aid and Protection of Human rights Act
- Educate the disabled people about their rights
- Analyse the human rights issues

PO/CO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	2	2	1	3
CO2	2	2	2	3	3	3
CO3	1	2	2	3	3	3
CO4	2	3	3	3	3	3
CO5	3	2	2	3	2	1
CO6	2	1	1	3	2	2
Optimum point	2	2	2	3	3	3

K1= Low, K2= Moderate, K3= Substantial





**DEPARTMENT OF MANAGEMENT STUDIES  
(MBA – AICTE APPROVED)**

**PROGRAMME OUTCOMES:**

- Demonstrate the knowledge of management science to solve complex corporate problems using limited resources
- Utilize qualitative and quantitative methods, to investigate and solve critical business problems.
- Integrate tools and concepts from multiple functional areas (i.e. finance, marketing, operations, Human Resource Management etc.) to solve business problems.
- Lead themselves and others in the achievement of organization goals, contributing effectively to a team environment.
- Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to management practice.
- Incorporate multicultural perspectives while making business decisions.
- Adopts a global perspective to understand cultural differences influencing businesses.
- Integrate concepts from various disciplines, to develop business strategies.
- Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- To negotiate effectively in order to achieve organizational and individual goals.

**PROGRAMME SPECIFIC OUTCOMES:**

- Systematic understanding of globalization and its impact on people, businesses and the economy.
- An ability to critically understand current issues (e.g., diversity, social responsibility, sustainability, innovation, knowledge management, etc.) in business.
- An ability to analyze a problem and adopt appropriate managerial skills for obtaining its solution.
- An ability to communicate effectively, both in writing and orally (speaking / writing skills).
- An ability to recognize the importance of professional development by pursuing post graduate studies or face competitive examinations, that offer challenging and rewarding careers in management.
- An ability to apply knowledge, skills and right attitude necessary to provide effective leadership in a global environment.
- An ability to develop competent management professionals with strong ethical values, capable of assuming a pivotal role in various sectors of the Indian Economy & Society, aligned with the national priorities.

- An ability to develop proactive thinking so as to perform effectively in the dynamic socio- economic and business ecosystem.
- The ability to understand, analyse and demonstrate the knowledge of human cognition, Artificial Intelligence, Machine Learning and data engineering in terms of real world problems to meet the challenges of the future.
- The ability to develop computational knowledge and project development skills using innovativetools and techniques to solve problems in the areas related to Deep Learning, Machine learning, Artificial Intelligence.

**MANAGEMENT CONCEPTS AND ORGANISATIONAL BEHAVIOUR**  
**(Theory)**

**First Year**  
**Code Course – I**  
**Code: P22MBACC11**

**Semester – I**  
**Credit - 5**

**OBJECTIVES:**

To enable students to have grounding in Management Theories and Practices. To understand other functional areas of management, through these concepts.

To provide the students to analyse specific strategic human resources demands for future action.

**UNIT – I:**

Management: Definition – Nature – Scope and functions – Evolution of management thought – Relevance of management to different type of organisation. Planning: Nature, importance and strategic considerations in planning – Planning Premises – components of planning as objectives, policies, strategies, procedures, methods, rules, projects and budgets.

**UNIT – II:**

Organising: Nature, purpose and kinds of organisation – Structure – Principles and theories of organization – Departmentation – Span of control – Line and staff functions - Centralisation and decentralisation – Staffing and Directing: General principles, importance and techniques. Delegation of Authority – Process or Elements of delegation – Advantages – Types – Principles how to make delegation effective. – Informal organization Objectives and process of control – Devices of control

**UNIT – III:**

Controlling: Objectives and process of control – Devices of control - Integrated control- Business process reengineering – Total quality management – Bench marking.

**UNIT – IV:**

Organisational Behavior – Definition - Need for studying Organizational Behavior, Disciplines involved in the study of Organizational Behavior -Contributing disciplines- Application of Organizational Behavior in Business  
- Contemporary challenges and opportunities for OB, Developing an OB model. International dimensions of OB.

**UNIT – V:**

Individual behaviour – personality, perception, learning, attitudes inter-personal behaviour – Group and inter-group behaviour. Group Dynamics – Formal and Informal Group, Group Norms. Management of change- conflict Management-, leadership-nature, styles and approaches, development of leadership including laboratory training.

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only):** Contemporary issues Related to the concepts of Management - Practical: Studying Management styles of two Global institutions in the lime-light- Mini Project - Group discussion and case study.

**TEXT BOOKS:**

1. Management concept, Theory and Practice, S.N Chand, Atlantic publishers, 2022.
2. Changing Behaviour at Work-A Practical Guide to Practitioners and Academicians.,Dr.Shibu N S andDr. R. Kalpana, International Research Publication House, New Delhi. 2016.
3. Organizational Behaviour, 8th Edition, Stephen P. Robbins, Pearson, 2018
4. Organizational Behavior: An Evidence - Based Approach, 12th Edition, Luthans, McGraw Hill Education,2017.
5. Organisation Behaviour, A modern approach – Arun Kumar & N. Meenakshi Vikas publishingHousePVT Ltd, 2015.

**REFERENCES:**

- Changing Behaviour at Work-A Practical Guide to Practitioners and Academicians, Dr.Shibu N S and Dr.R.Kalpana , International Research Publication House, New Delhi, 2015.
- Culture and organisational Behaviour Jai B.P. Sinha, Sage publications, 2018.
- Organizational Behaviour, Special Indian Edition – by Steven L Mcshane, Mary Ann Von Glinow andRadha R. Sharma, Tata Mcgraw hill co., 2018.
- Management of Organizational Behaviour Indian Edition, By Paul Hersey Kenneth. H. Blanchard andDewey – PHI learning PVT Ltd., 2015.
- Essentials of Organizational Behavior, Fourteenth Edition, Stephen P. Robbins, Timothy A. Judge,Pearson, 2019

**E-RESOURCES:**

- <https://www.classcentral.com/course/independent-principles-of-management-11932>
- <https://www.coursera.org/learn/principles-of-management>
- <https://www.mygreatlearning.com/academy/learn-for-free/courses/principles-of-management>
- [https://onlinecourses.nptel.ac.in/noc21\\_mg30/preview](https://onlinecourses.nptel.ac.in/noc21_mg30/preview)
- <https://www.udemy.com/course/principles-of-management-j/>

**COURSE OUTCOMES:**

- On completion of this course, the students will be able to:
- Explain the Importance & Role of Management in the Organizations.
- Evaluate the different aspects related to Decision Making and Controlling Process
- Describe the different theories related to Individual behavior in the Organization.
- Analyze Group Behavioral influence in the Organization.
- Analyze the complexities associated with management of the group behavior in the organization.

**SEMESTER I: CORE I  
MANAGEMENT CONCEPTS AND ORGANIZATIONAL BEHAVIOR (P22MBACC11)  
MAPPING**

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBACC11	3	3	3	3	2
P22MBACC11	3	2	2	3	3
P22MBACC11	3	3	2	3	2
P22MBACC11	2	3	3	2	2
P22MBACC11	3	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director

## MATHEMATICS AND STATISTICS FOR MANAGERS

**First Year**  
**Code Course – II**  
**Code: P22MBACC12**

**Semester – I**  
**Credit - 5**

### **COURSE OBJECTIVES:**

- To develop the students, ability to deal with numerical and quantitative issues in Business
- To inspire knowledge across different areas in Statistics and Actuarial Science.
- To impart knowledge on Statistical concepts like Data Collection, Measures of Central, Tendency and Dispersion, Probability and Distributions, Statistical Methods, Inference, Sampling methods, Experimental Designs, Economical and Vital Statistics, SQC, reliability and Operations Research.

### **UNIT – I**

Mathematical basis of managerial decisions: Functions – Application of functions – maxima & Minima – Matrix Algebra – Arithmetical Operations – Properties, Solutions of equations by inverse method, Gauss – Jordan method and Cramer's rule:

### **UNIT – II**

Linear Programming – Formulation – Graphical methods – Simplex Method (Simple problems) - Introduction to Probability – Addition & Multiplication theorems – Bayes theorems and its applications. Theory of expectation – EMV.

### **UNIT – III**

Descriptive Statistics – measures of central tendency – measures of dispersion; Skewness & Kurtosis – Frequency distribution – Histograms – Polygons. Definition of random variable – Binomial distribution, Poisson distribution, Normal distribution – Applications to Business situations.

### **UNIT – IV**

Preliminary concept of sampling - Types of samples - Deliberate, Judgement sampling – Quota sampling - Cluster sampling - Probability sampling - Random sampling- Stratified sampling- Systematic sampling- Multistage sampling. Testing of Hypothesis and Theory of inference – Type I and II errors. Concept of sampling distribution – test of significance for means, proportions and S.Ds. Large samples: Analysis of Variance one- way classification.

### **UNIT – V**

Theory of Correlation and Regression: Meaning of Correlation and regression – Principles of Least squares – Simple Linear Regression – Simple correlation – Co-efficient – Rank Correlation – Multivariate and partial correlation - bivariate regression model, regression coefficients; coefficient of determination

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only) Contemporary**

Developments Related to the Quantitative Techniques for Management Decisions - Practical: Studying on F test – ANOVA – Chi – Square test – Mini Project on Quantitative Techniques and Correlation analysis.

### **TEXT BOOKS:**

- Business Statistics: Communicating with Numbers (4th ed.), Jaggia, S., McGraw-Hill Higher Education, 2021
- Business Statistics (3rd ed.), Jr., D. R., Pearson, 2019
- Business statistics, K. Alagar, Tata Mcgraw Hill, 2016.
- Mathematics for Management, M. Ragavachari, Tata Mcgraw Hill, 2018.
- Statistics for Management, TN Srivastava and Shailaja Rego, Tata mcgraw Hill, 2015.

### **REFERENCES:**

- Practical Business Statistics (7th ed.), Siegel, A. F., (2016), Academic Press, 2016.
- Complete Business statistics, Indian Edition, Aczel and Soundar Pandian, Tata Mcgraw Hill, 2015.
- Applied Statistics in Business and Economics, David P. Doane and Lori E. Seward, Indian Edition, Tata McGraw Hill, 2018.
- Business statistics, Bharat Jhunjunwala, S. Chand.co, 2018.
- Mathematics for Economics and finance, Martin Anthony and Norman biggs, Cambridge University press, 2019.

### **E-RESOURCES:**

- <https://www.coursera.org/courses?query=quantitative%20methods>
- <https://hbsp.harvard.edu/product/504702-HTM-ENG>
- <https://www.classcentral.com/course/swayam-quantitative-techniques-for-management-20268>
- <https://www.crisil.com/en/home/crisil-1academy/eLearning/risk-management/quantitative-techniques.html>
- <https://careerkarma.com/blog/quantitative-methods/>

### **COURSE OUTCOMES:**

On completion of this course, the students will be able to:

- Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis
- Discuss critically the uses and limitations of statistical analysis
- Summarize and analyze statistical data to solve practical business related problems.
- Interpret the relevance of statistical findings for business problem solving and decision making.
- Able to apply technology to statistical analysis and problem solving.

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**SEMESTER I: CORE II**  
**MATHEMATICS AND STATISTICS FOR MANAGERS (P22MBACC12)**

**MAPPING**

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22MBACC12</b>	3	2	3	2	3
<b>P22MBACC12</b>	3	3	2	3	3
<b>P22MBACC12</b>	3	2	2	3	3
<b>P22MBACC12</b>	3	3	2	2	3
<b>P22MBACC12</b>	3	3	2	2	3
<b>Optimum Point</b>	3	3	2	2	3



Signature of the Director

## **ACCOUNTING FOR MANAGERS**

**First Year**  
**Code Course – III**  
**Code: P22MBACC13**

**Semester – I**  
**Credit - 5**

### **COURSE OBJECTIVES:**

- This course will enable the students to combine practice and theoretical knowledge of financial accounting.
- The course will provide decision making skills through financial analysis.
- Students are expected to gain the ability of using accounting information as a tool in applying solutions for managerial problems, evaluating the financial performance, and interpreting the financial structure.

### **UNIT – I**

Purpose and Scope; changing role of Accountant in profession, industry and as a consultant; Basic accounting concepts and postulates and their implications. Accounts Records and Systems; The journal and other subsidiary books. The Ledger and account, debit and credit, adjusting and closing entries, ruling and balancing accounts. The trial balances. Construction of Profit and Loss Account and Balance Sheet of joint stock companies as per companies' act requirement.

### **UNIT – II**

Cost concepts, determination of costs, elements of Cost-cost classification- Preparation of cost sheet, tender.

### **UNIT – III**

Overheads, Allocation, Apportionment, Absorption, Control over Factory, administration, selling and distribution Overheads, valuation of Inventories.

### **UNIT – IV**

Marginal costing – Distinction between absorption costing and marginal costing- Cost volume profit (CVP) Analysis- Break Even Analysis- Margin of safety.

### **UNIT – V**

Budget and budgetary control - Objectives- Advantages and limitations- Production budget - Sales budget- Cash budget and Flexible budget.

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)** Recent developments in accounting practices– case study relating to financial analysis and working capital performance of companies. Group discussion.

**TEXT BOOKS:**

1. Pandey, I.M, Financial Management, 11th Edition, Vikas Publication, New Delhi, 2018.
2. Sinha, Pradeep Kumar, Financial Management, 5th Edition, The World Press, Calcutta, 2019.
3. Management Accounting, My Khan & P K Jain, Tata Mcgraw hill, 2016
4. Management Accounting, Paresh shaw, Oxford University Press, 2015.
5. Management Accounting, A. Murthy and S. Gurusamy, Tata Mcgraw Hill, 2018.

**REFERENCES:**

- Jan Williams, Financial and Managerial Accounting– The basis for business Decisions, 15th edition, TataMcGraw Hill Publishers, 2015.
- Horngren, Surdem, Stratton, Burgstahler, Schatzberg, Introduction to Management Accounting, PHILearning, 2011.
- tice&Stice, Financial Accounting Reporting and Analysis, 8th edition, Cengage Learning, 2017.
- Singhvi Bodhanwala, Management Accounting –Text and cases, PHILearning, 2016.
- Ashish K. Battacharya, Introduction to Financial Statement Analysis, Elsevier, 2016.

**E-RESOURCES:**

- <http://www.sxccal.edu/TwinningProgramme/downloads/MBA-Accounting-Managers 1stYear.pdf>.
- <https://www.classcentral.com/course/edx-financial-management-in-organizations-9109>
- <https://alison.com/courses/accounting>
- <https://www.oxfordhomestudy.com/courses/accounting-courses-online/free-online-accounting-courses>
- <https://www.udemy.com/topic/accounting/free/>

**COURSE OUTCOMES:**

On completion of this course, the students will be able to:

- Understand the nature and role of the four principal financial statements (i.e., the Income Statement, the Statement of Financial Position, the Statement of Cash Flows, and the Statement of Changes in Equity)
- Develop an awareness and understanding of the accounting process and fundamental accounting principles that underpin the development of financial statements (e.g. accrual accounting vs. cash accounting, definition, recognition, measurement and disclosure of assets, liabilities, revenues, expenses; inventory valuation methods, provisions, depreciation; accounting for intangibles)
- Ability to read, interpret and analyse financial statements and combine financial analysis with other information, to assess the financial performance and position of a company
- Understand and apply course concepts to analyse common business management decisions such as pricing and outsourcing decisions from a financial perspective
- Understand the role of budgets in organisations, their limitations and the behavioural issues to consider while developing and using budgets for planning and control

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**SEMESTER I: CORE III**  
**ACCOUNTING FOR MANAGERS**  
**(P22MBACC13)**

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

PO/PSO	PO1	PO2	PO3	PO4	PO5
<b>CO</b>					
<b>P22MBACC13</b>	3	3	3	3	2
<b>P22MBACC13</b>	3	3	2	3	3
<b>P22MBACC13</b>	3	2	2	3	2
<b>P22MBACC13</b>	2	3	3	3	1
<b>P22MBACC13</b>	3	3	2	2	2
<b>Optimum Point</b>	3	3	2	3	2



Signature of the Director

## **MANAGERIAL COMMUNICATION**

**First Year**

**Code Course – IV**  
**Code: P22MBACC14**

**Semester – I**

**Credit - 5**

### **COURSE OBJECTIVES**

- To provide an overview of Prerequisites to Business Communication.
- To put in use the basic mechanics of Grammar.
- To provide an outline to effective Organizational Communication

### **UNIT – I**

Communication – Meaning and Significance for Management – Types of Communication Media – Process of Communication – Barriers to Communication - Principles of Effective Communication.

### **UNIT – II**

Correspondence – Norms for Business Letters – Letter for different kinds of situations – Personalized stand letters, enquiries, customers' complaints, collection letters – Sales promotion letters – Job Application Letters- Bio-Data-Covering Letters, Interview letters, Letter of Reference

### **UNIT – III**

Non-verbal communication – Personal Appearance Posture – Body Language – Use of Charts, Diagrams & Tables – Visual & Audio Visual Aids for communication – Dyadic communication: Face to Face Communication –Listening: Meaning, Importance, Types of listening, Tips for effective listening, Barriers for listening

### **UNIT – IV**

Report Writing – Structure of Reports – Long & Short Reports – Formal & Informal Reports – Writing Research Reports, Technical Reports – Norms for including Exhibits & Appendices.

### **UNIT – V**

Conducting Meetings: Procedure – Preparing agenda, Minutes and Resolutions Conducting Seminars & Conferences: Procedure of Regulating Speech Evaluating Oral Presentation – Group Discussion: Drafting Speech.

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)** Students are advised to form small groups among themselves and practice face to face communication, enhance use of Body Language and Draft a Speech for various occasions

**TEXT BOOKS:**

1. Business Communication, N. Gupta, K. Jain, P. Mahajan, Sahitya Bhawan Publications, 2021.
2. Business communication, principles and methods and Techniques, Nirmal Singh, Deep and Deep Publications Pvt Ltd., 2018.
3. Business communication, Sri Jin Kushal, Suniti Ahuja, VK Global Publications Pvt Ltd, 2020.
4. Business communication, Meenakshi Raman, Prakash Singh, Oxford university press, 2016.
5. Foundations of Business communication, India Edition, Dona. J. Young, Tata mcgraw Hill, 2018.

**REFERENCES:**

1. Essentials of Business Communication (11th ed.), Guffey, M. E., & Loewy, D, Cengage Learning, 2018.
2. Business communication, Making connections in a Digital world, Indian Edition, Raymond V Lesikar, Tata Mcgraw Hill, 2015
3. *Business Communication* (3rd ed), Means, T., Cengage Learning, 2019.
4. Business communication, Asha kaul, PHI learning private ltd., 2018
5. Professional communication, Aruna Koneru, Tata mcgraw Hill, 2016

**E-RESOURCES:**

1. <https://www.edx.org/learn/business-communications>
2. <https://learndigital.withgoogle.com/digitalunlocked/course/business-communication>
3. <https://www.eduonix.com/courses/Office-Productivity/a-complete-guide-for-effective-communication> business-
4. <https://www.futurelearn.com/courses/effective-communication>
5. <https://learn.saylor.org/course/BUS210>

**COURSE OUTCOMES:**

On completion of this course, the students will be able to

- Familiar with the complete course outline/Course Objectives/Learning Outcomes/ Evaluation Pattern & Assignments
- Participate in an online learning environment successfully by developing the implication-based understanding of Paraphrasing, deciphering instructions, interpreting guidelines, discussion boards & Referencing Styles.
- Demonstrate his/her ability to write error free while making an optimum use of correct Business Vocabulary & Grammar.
- Distinguish among various levels of organizational communication and communication barriers while developing an understanding of Communication as a process in an organization.
- Draft effective business correspondence with brevity and clarity.

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**SEMESTER I: CORE IV**

**Managerial communication (P22MBACC14)**

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22MBACC14</b>	3	2	3	2	-
<b>P22MBACC14</b>	3	3	2	3	-
<b>P22MBACC14</b>	3	2	2	3	3
<b>P22MBACC14</b>	3	3	3	2	3
<b>P22MBACC14</b>	3	3	3	3	3
<b>Optimum Point</b>	3	3	3	3	3



Signature of the Director

## ETHICS IN BUSINESS

**First Year**  
**Code Course – V**  
**Code: P22MBACC15**

**Semester – I**  
**Credit - 5**

### **COURSE OBJECTIVES**

- To understand the Business Ethics and to provide best practices of business ethics.
- To learn the values and implement in their careers to become a good manager.
- To develop various corporate social Responsibility and practice them in their professional life

#### **UNIT – I**

Introduction to Business Ethics – Meaning, Requirement of ethics in business, need, importance for ethics in business – Moral Vs Ethics, Law vs Ethics – issues involved in business ethics - Benefits of business ethics.

#### **UNIT – II**

Ethics at Workplace – Role of individual morals and Standards in defining work place ethics – Factors influencing behavior – issues involved in HRD – Ethical issues of individual in workplace – Guide lines for managing ethics in the work place.

#### **UNIT – III**

Ethics in Accounting and Finance – Fundamental principles of ethics in the context of Finance and Accounting – Creating an ethical accounting environment – Reasons for unethical behavior – Threats faced by Finance and Accounting Professional.

#### **UNIT – IV**

Ethics in Marketing and Consumer Protection – Ethical issues involved in Marketing – Need for ethical guidance – competition – consumer – consumer protection councils in India – Rights for Consumer – Ethics in Advertisement

#### **UNIT – V**

Corporate Social Responsibility (CSR) – Meaning, Importance – Features of CSR – Basic initiatives in the field of CSR and sustainable development – Corporate CSR reports – Globalization of CSR.

#### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only) :**

Contemporary issues Related to Business Ethics - Practical: Studying the Role of Ethics in Organization - Mini Project on CSR and Related Case Study- Group discussion



## **TEXT BOOKS :**

1. Business Ethics : An Indian Perspective, Third Edition, A C Fernando, K P Muralidheeran, E K Satheesh, Pearson, 2019.
2. Business Ethics: Concepts and Cases, Velasquez, Pearson Education India, 2016.
3. Business Ethics and Corporate Governance, Second Edition, Fernando, Pearson, 2018.
4. Business Ethics and Corporate Governance, G. Naga Raju K. Viyyanna Rao, Dreamtech Press, 2020.
5. Business Ethics and Corporate Governance, Khanka S.S., S Chand, 2015.

## **REFERENCES**

1. Corporate governance Business Ethics and CSR, Sharma, ANE Books India, 2017.
2. Business Ethics: What Everyone Needs to Know (What Everyone Needs to Know), Nelson, J. S., & Stout, A. L., Oxford University Press, 2022.
3. Business Ethics: Best Practices for Designing and Managing Ethical Organizations (Third ed.), Collins, D., & Kanashiro, P., SAGE Publications, Inc., 2021.
4. Business Ethics: Decision Making for Personal Integrity & Social Responsibility (5th ed.), Hartman, L., DesJardins, J., & MacDonald, C., McGraw-Hill Education, 2020
5. Business Ethics: A Textbook with Cases (9th ed.), Shaw. W. H., Cengage Learning, 2016.

## **E-RESOURCES**

1. <https://www.edx.org/learn/business-ethics>
2. <https://alison.com/course/ethical-intelligence-in-business>
3. <https://www.classcentral.com/course/canvas-network-business-ethics-for-the-real-world-1323>
4. <https://www.coursera.org/learn/business-ethics>
5. <https://www.oxfordhomestudy.com/courses/business-studies-online/business-code-of-ethics>

## **COURSE OUTCOMES**

On completion of this course, the students will be able to

1. Recognize organizational challenges to ethical behaviour.
2. Evaluate common beliefs about ethics—especially common beliefs about the role of ethics in business.
3. Recognize the inherent conflict of interest in many business decisions.
4. Demonstrate knowledge of established methodologies of solving ethical problems.
5. Apply moral reasoning to specific situations and defend the conclusions of that reasoning.

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**SEMESTER II: CORE V**  
**Ethics in Business(P22MBACC15)**

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO</b>					
<b>P22MBACC15</b>	3	3	3	3	2
<b>P22MBACC15</b>	3	3	-	3	3
<b>P22MBACC15</b>	3	3	-	3	2
<b>P22MBACC15</b>	3	3	3	3	2
<b>P22MBACC15</b>	3	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the director

## **ENVIRONMENTAL MANAGEMENT**

**First Year**  
**Code Course – I**  
**Code: P22MBAE1C**

**Semester – I**  
**Credit - 4**

### **COURSE OBJECTIVES**

- To enable students to examine and evaluate Environment Issues in Business
- The objective of the course is to build professional capabilities, to develop and adopt Policies, measures and programmes for environmental management.
- The course aims to make the students aware of the importance of conserving the world's fast depleting resources through a rational utilization of the environmental endowments of life support systems.

### **UNIT – I**

Environmental Management - Basic idea and Terminologies - The concept of sustainable development - Different measures - Limits to growth – Economy - Environment interdependence - The Environment Kuznets curve.

### **UNIT – II**

Efficiency and optimality in resource allocation - achieving an efficient allocation of resources in a market economy - Market failure and public policy.

### **UNIT – III**

Environmental issues - global problems - Sources of Pollution - Air, Water and soil pollution - Pollution control instruments.

### **UNIT – IV**

Environmental Management System - Environmental Standards, ISO 14000 - Environmental auditing - environmental clearance for establishing and operating industries in India - Environment legislation.

### **UNIT – V**

Environmental (Protection) Act: The Water (Prevention and Control of Pollution) - The Wildlife Protection Act; Forest Conservation Act; Issues involved in enforcement of environmental legislations.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Recent challenges and development in Environmental management, impact of the society. Case study relevant to environmental management, group discussion. Field visit.

### TEXT BOOKS

1. The Legal Environment of Business: A Managerial approach, theory and practice 4th edition (4th ed.), Melvin, S. P., & G., McGraw Hill, 2020.
2. The International Business Environment 4e (4th ed.), Hamilton, L., & Webster, P., Oxford University Press, 2019.
3. Meiners, R. E., Ringleb, A. H., & Edwards, F. L. (2017). The Legal Environment of Business (13th ed.). Cengage Learning, 2017.
4. Environment and Pollution law manual, Mohanty S.K., universal Law publishing, 2016.
5. Environmental Economics, Harly Nick, Oxford University Press, 2015.

### REFERENCES

- Introduction to Global Business: Understanding the International Environment & Global Business Functions (2nd ed.), Gaspar, J., Kolari, J., Hise, R., Bierman, L., & Smith, M. L., Cengage Learning, 2016.
- R Rajagopalan, Environmental Studies. Oxford Reference Books, 2015.
- S K Agrawal, Environmental Management, A.P.H. publishing Corporation, 2018.
- Pandey G.N, Environmental Management Vikas publishing house, 2017.
- Roger Perman et al. Natural Resources and Environment Economics, Orient Longmans, 2015.

### E-RESOURCES

- <https://www.edx.org/professional-certificate/usmx-environmental-management-for-sustainability>
- [https://onlinecourses.swayam2.ac.in/nou22\\_ag16/preview](https://onlinecourses.swayam2.ac.in/nou22_ag16/preview)
- [https://onlinecourses.nptel.ac.in/noc22\\_ce69/preview](https://onlinecourses.nptel.ac.in/noc22_ce69/preview)
- [https://books.google.co.in/books?id=42YRAQ9ZpFMC&pg=PP15&source=gbs\\_selected\\_pages&cad=2#v=onepage&q&f=false](https://books.google.co.in/books?id=42YRAQ9ZpFMC&pg=PP15&source=gbs_selected_pages&cad=2#v=onepage&q&f=false)
- <https://es.coursera.org/lecture/environmental-management-ethics/introduction-to-environmental-ethics-0b14B>

### COURSE OUTCOMES

On completion of this course, the students will be able to

- Align sustainability initiatives with organization mission and core values.
- Manage environmental-related risk from an organization's operation.
- Identify environmental hazards affecting air, water and soil quality.
- Assess environmental-related risk in Business.
- Develop controls to reduce or eliminate risk

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**SEMESTER I: CORE COURSE -I  
ENVIRONMENTALMANAGEMENT(P22MBAE1C) MAPPING**

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO</b>					
<b>P22MBAE1C</b>	3	2	3	2	3
<b>P22MBAE1C</b>	3	3	3	3	3
<b>P22MBAE1C</b>	3	3	3	3	3
<b>P22MBAE1C</b>	3	3	3	2	3
<b>P22MBAE1C</b>	3	3	3	2	3
<b>Optimum Point</b>	3	3	3	2	3



Signature of the Director

## EVENT MANAGEMENT

**First Year**  
**Value Added Course – I**  
**Code: P22MBAVAC1**

**Semester – I**  
**Credit - 2**

### **COURSE OBJECTIVES**

1. To understand the process of managing and marketing events from conceptualization, planning and feasibility analysis, to staging the event and post-event evaluation
2. To describe the role and special nature of events and their significance for sustainable business development and host community
3. To identify the potential impact of events including economic, social, cultural, and environmental, and the implications of these for sustainable business development

### **UNIT - I**

Introduction - Principles of Event Management – Understand resources, activities, risk management, delegation, project selection, role of the event manager. Understanding the facts – Conducting market research, establishing viability, capacities, costs and facilities.

### **UNIT – II**

Preparing a proposal – Clarity, SWOT analysis, estimating attendance, media coverage, advertising, budget, special considerations, success. Crisis management plan – Crisis planning, prevention, provision, action phase, handling negative publicity, structuring the plan.

### **UNIT – III**

Seeking sponsors – Different types of sponsorship, definition, objectives, target market, budget, strategic development, implementation, evaluation. Organising the event – Purpose, Venue, timing, guest list, invitations, food & drink, room dressing, equipment, guest of honour, speakers, media, photographers, podium, exhibition.

### **UNIT – IV**

Marketing tools – Types of advertising - Media tools – Media invitations, photo calls, press releases, TV opportunities, radio interviews.

### **UNIT – V**

Promotional tools - Evaluation- Budget, cost of event, return on investment, media coverage, attendance, feedback.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary issues Related to the Course during the semester. Practical: Studying Management styles of two Indian institutions in the lime-light- Mini Project on Event management of the firms in the Locale - role play, Group discussion

### TEXT BOOK

1. Event Management and Marketing: Theory, Practical Approaches and Planning, Dr. Anukrati Sharma and Dr. Shruti Arora, Bharti Publication, 2018
2. Event Management - A Zero Investment Startup Business Paperback, Abhijeeth Bhattacharjee, 2020
3. Event Management, 1e, WAGEN, Pearson India, 2015.
4. Event Planning and Management: Principles, Planning and Practice (PR in Practice) (2nd ed.), Dowson, R., & Bassett, D., Kogan Page, 2018.
5. Events Management: Principles and Practice (3rd ed.), Raj, R., Walters, P., & Rashid, T., SAGE Publications Ltd, 2017.

### REFERENCES

- Event Planning: Management & Marketing for Successful Events: Become an event planning pro & create a successful event series (1st ed.), Genadinik, A., CreateSpace Independent Publishing Platform, 2015.
- Professional Meeting Management: A Guide to Meetings, Conventions, and Events (Sixth ed.), Professional Convention Management Association (PCMA), Agate B2, 2015.
- Event Management: A blooming industry and an eventful career, Devesh Kishore & Ganga Sagar Singh, Har Anand Publication, 2018.
- The Art of Successful Event Management, Leelamma Devasia & V.V. Devasia, APH Publishing Corporation, 2017
- Start your own event planning business 3/E: Your step by step guide to success, Perseus Books Group, Cheryl Kimball, Entrepreneur Press, 2015.

### E-RESOURCES

- <https://www.oxfordhomestudy.com/courses/event-management-courses-online/event-planning-courses-online-free>
- <https://www.udemy.com/course/event-planning-and-management/>
- <https://www.classcentral.com/tag/event-management>
- <https://www.bolc.co.uk/events-management-courses-online/free-event-management-courses>
- <https://www.coursera.org/courses?query=event%20management>

### COURSE OUTCOMES

On completion of this course, the students will be able to

- Obtain a sense of responsibility for the multi-disciplinary nature of event management
- Gain confidence and enjoyment from involvement in the dynamic industry of event management
- Identify best practice in the development and delivery of successful conferences and corporate gatherings
- Identify the key elements of a conference and the processes involved in venue selection, registration, catering, accommodation, transport, theming, security and entertainment
- Identify management essentials such as developing budgets, critical paths, work breakdown structures, risk mitigation and contingency planning.

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**SEMESTER I:**

**VALUE ADDED COURSE-I (P22MBAVAC1)**

**Event Management  
MAPPING**

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>P22MBAVAC1</b>	3	2	3	2	3
<b>P22MBAVAC1</b>	3	3	2	3	3
<b>P22MBAVAC1</b>	3	2	2	3	3
<b>P22MBAVAC1</b>	3	3	3	2	3
<b>P22MBAVAC1</b>	3	3	3	2	3
<b>Optimum Point</b>	3	3	3	2	3



Signature of the Director



## STRATEGIC MANAGEMENT

**Second Year**

**Core Course – XI**

**Code: P22MBACC31**

**Semester – III**

**Credit - 5**

### **COURSE OBJECTIVES:**

To expose students to various perspectives and concepts in the field of Strategic Management

The course would enable the students to understand the principles of strategy formulation, implementation and control in organizations.

To help students develop skills for applying these concepts to the solution of business problems

### **UNIT – I**

Strategic management – definition, need, dimensions – strategic planning – strategic decision making process – benefit and risks of strategic management – ethics and social responsibility.

### **UNIT – II**

Strategic management process – vision and mission of the company – business vision models – objectives and goals. Business policies and strategies.

### **UNIT – III**

Environmental scanning and analysis – types: international, external, internal – characteristics - SWOT – approaches of the environmental scanning.

### **UNIT – IV**

Generic - competitive strategies – integration strategies – outsourcing strategies – offensive and defensive strategies – strategic alliances and collaborative partnerships – merger and acquisition – diversifications – tailoring strategies to fit specific industry and company situations.

### **UNIT – V**

Building resource strengths and organizational capabilities – frame work for executing strategy – strategy execution process – organizational structure – managing internal operations corporate culture of leadership – designing strategic control system - key success factors – monitoring success and evaluating deviation.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary issues Related to the management - Studying Recent challenges and development in Strategic management  
- Case study relevant to Strategic management and group discussion.

### TEXT BOOKS

1. Strategic Management, Thomas, Pearson Education India, 2015.
2. Strategic Management, Azhar Kazmi, Adela Kazmi, McGraw Hill, 2020.
3. Strategic Management, SIA Publishers & Distributors Pvt Ltd, 2022.
4. Strategic Management and Business Policy: Globalization, Innovation and Sustainability, Thomas L. Wheelen, J. David Hunger, Pearson, 2018.
5. Strategic Management and Competitive Advantage: Concepts and Cases, Jay B. Barney, William
6. S. Hesterly, Pearson Publications, 2018.

### REFERENCES

1. Strategic Management & Innovations in Banking, IIBF, Macmillan Education, 2021
2. Business policy and strategic management concept and application, Vipin Gupta, Kamala Gollakota, R. Srinivasan, Oxford University Press, 2015.
3. Business policy and Strategic Management, Sukul Lomesh, P.K.P.K. Mishra, Tata Mc Graw Hill, 2016.
4. Strategic Management An integrated approach, Charles W.L. Hill, Gareth R. Jones, Cengage Learning, 2015.
5. Business Strategy Essentials You Always Wanted to Know, Callie Daum, Vibrant Publishers, 2020.

### E – RESOURCES

1. <https://www.eresourcescheduler.com/blog/5-effective-resource-management-strategies-that-drive-productivity-in-2022>
2. <https://www.businessballs.com/strategy-innovation/>
3. <https://www.edx.org/learn/strategic-management>
4. <https://www.coursera.org/learn/strategic-management>
5. [https://onlinecourses.nptel.ac.in/noc22\\_mg88/preview](https://onlinecourses.nptel.ac.in/noc22_mg88/preview)

### COURSE OUTCOMES

On completion of this course, the students will be able to

1. Describe major theories, concepts and research output in the field of strategic management.
2. Demonstrate a clear understanding of the concepts, tools & techniques used by executives in developing and executing strategies and will appreciate its interdisciplinary nature.
3. Identify the effective application of concepts, tools & techniques to practical situations for diagnosing and solving organisational problems.
4. Know the capability of making their own decisions in dynamic business landscape.
5. Develop their capacity to think and execute strategically.

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SEMESTER III:

CORE COURSE – XI

STRATEGIC MANAGEMENT (P22MBACC31) MAPPING

CO - PO – PSO matrices of course

K1: Low K2: Moderate K3: Substantial

PO/PSO	PO1	PO2	PO3	PO4	PO5
CO					
P22MBACC31	3	2	3	2	3
P22MBACC31	3	3	2	3	3
P22MBACC31	3	2	2	3	3
P22MBACC31	3	3	3	2	3
P22MBACC31	3	3	3	2	3
Optimum Point	3	3	3	2	3



Signature of the Director

## **RESEARCH METHODS IN MANAGEMENT**

**Second Year**

**Core Course – XII**

**Code: P22MBACC32**

**Semester – III**

**Credit - 5**

### **COURSE OBJECTIVES**

- To familiarize students with the basics of research and the research process.
- To help students in conducting research work and generating research reports.
- To familiarize students with Statistical packages such as EXCEL etc.

### **UNIT – I INTRODUCTION**

Research – Importance and its types – research approaches – process – problem formulation – development of hypothesis – Research design – determining the sample design – collecting data – analysis of data – identifying research problem.

### **UNIT – II MEASUREMENT AND ITS TECHNIQUES**

Measurement in research and its problems – meaning of scaling – tests of sound measurement – types of scaling- Techniques of measurement – Attitude scales – summated rating scale – Equal appearing Interview scale – cumulative scale – Rating scale – Scale constructing Techniques.

### **UNIT – III DATA COLLECTION AND HYPOTHESIS**

Classification of data – sources of data – collection of primary and secondary data – Questionnaire method – Guidelines for Questionnaire design – Interview technique – Observation techniques – Processing of data – Editing – Coding – Tabulation – Interpretation of data – Formulation of hypothesis – Test of hypothesis.

### **UNIT – IV STATISTICAL TECHNIQUES**

Statistical Techniques – Measures of Central Tendency – Arithmetic mean, Median and Mode – Karl Pearson's coefficient of correlation – Regression – Chi-square test – conditions for applying chi- square test – ANOVA – Spearman's Rank Correlation.

### **UNIT – V INTERPRETATION AND REPORT WRITING**

Interpretation – Techniques of Interpretation – Significance of Report Writing- Different steps in writing report – layout of research report – types – oral presentation – mechanics of writing a research report – precautions for writing research reports – Role of statistical packages in Research.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary issues Related to the Principle of management - Practical class- Analysis of data using statistical Packages, data analysis using MS-Excel, hypothesis testing, solve the problems need immediate solution. Group discussion

### TEXT BOOK

1. Research Methodology: Methods and Techniques, C.R. Kothari, Gaurav Garg, New Age International Publishers, 2019.
2. Research Methods, M.P. Sinha, Atlantic Publication, 2022.
3. Business Research Methods, Donald R. Cooper, Pamela S. Schindler, J. K. Sharma, McGraw Hill Education, 2018.
4. An Introduction to Qualitative Research Synthesis, Claire Howell Major, Maggi Savin-Baden, Routledge Publication, 2016.
5. Research Methods in Social Sciences and Extension Education, G.L. Ray, S. Mondal, Kalyani Publishers, 2016.

### REFERENCES

1. Handbook of Research Methods and Applications in Experimental Economics, Arthur Schram, Alja Ule, Edward Elgar Publishing Ltd, 2019.
2. An Introduction to Qualitative Research Synthesis: Managing the Information Explosion in Social Science Research, Claire Howell Major, Maggi Savin-Baden, Routledge Publication, 2015.
3. Academic writing, A guide for management students and Researchers, Mathukutty M. Monippally and Badrinarayanan Shankar Pawar, Sage Publication, 2014.
4. Applied Multivariate Statistical Analysis, Johnson/Wichern, Pearson, 2015.
5. The Art of Statistics: Learning from Data, David Spiegelhalter, Pelican, 2020.

### E-RESOURCES

1. [https://onlinecourses.nptel.ac.in/noc22\\_ge08/preview](https://onlinecourses.nptel.ac.in/noc22_ge08/preview)
2. [https://onlinecourses.swayam2.ac.in/nou21\\_cm03/preview](https://onlinecourses.swayam2.ac.in/nou21_cm03/preview)
3. <https://www.coursera.org/browse/physical-science-and-engineering/research-methods>
4. [https://nie.gov.in/icmr\\_sph/Online-courses.html](https://nie.gov.in/icmr_sph/Online-courses.html)
5. <https://www.ccrm.in/>

### COURSE OUTCOMES

On completion of this course, the students will be able to

1. Have an understanding on objectives of doing research, various kinds of research, research process, research designs and sampling.
2. Formulate research problem and develop a sufficiently coherent research design.
3. Have basic knowledge on qualitative, quantitative as well as measurement & scaling techniques.
4. Have a basic awareness of data analysis, including descriptive & inferential measures.
5. Be able to develop and write independent thinking for critical analysis of research reports.

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SEMESTER III:

CORE COURSE -XII

RESEARCH METHODS IN MANAGEMENT (P22MBACC32)MAPPING

CO - PO – PSO matrices of course

K1: Low K2: Moderate K3: Substantial

PO/PSO	PO1	PO2	PO3	PO4	PO5
CO					
P22MBACC32	3	3	3	3	2
P22MBACC32	3	3	2	3	3
P22MBACC32	3	3	2	3	2
P22MBACC32	3	3	3	3	2
P22MBACC32	3	3	3	2	-
Optimum Point	3	3	3	3	2



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## **OPERATIONS RESEARCH**

**Second Year**

**Core Course – XIII  
Code: P22MBACC33**

**Semester – III**

**Credit - 5**

### **COURSE OBJECTIVES**

To impart knowledge in concepts and tools of Operations Research  
To understand mathematical models used in Operations Research  
To apply these techniques constructively to make effective business decisions.

#### **UNIT – I**

Introduction to Operations Research, scope, phases- merits and limitations – concept of optimization, Theory of simplex methods to solve canonical and general LPP, Primal – dual problem and its properties, dual simplex method, Sensitivity analysis. Concept of Goal Programming.

#### **UNIT – II**

Transportation problem by Vogel's approximation method; assignment problem, linear Programming complete enumeration method.

#### **UNIT – III**

Network analysis – drawing of Arrow diagram – critical path method – calculation of critical path duration, total, free and independent floats, PERT problems; Inventory Theory, Deterministic models – purchase problem without and with shortages, with price breaks, production problem without shortages.

#### **UNIT – IV**

Decision under risk – expected money value criterion – decision trees – decision under uncertainty – minimax criterion; Theory of Games – pure and mixed Strategies, Principles of dominance, graphical methods, simplex methods.

#### **UNIT – V**

Queuing theory – M/M/1/FIFO/OC model; Markovian chain, Simulation: Monte Carlo Method.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary issues Related to Operation Research - Studying Game theory, Queuing Theory - Casestudy.

### TEXT BOOKS

1. Operations Research, SC Aggarwal, Salendra Mittal, VK Global Publications Pvt Ltd, 2020.
2. Operations Research, Hamdy A. Taha, Pearson, 2019.
3. Operations Research - Introduction to Management Science, A Panel of Authors, S Chand, 2019.
4. Operation Research, J.K. Sharma, Laxmi Publications, 2017.
5. Operations Research, R.K. Gupta, Krishna Prakashan Media Pvt. Ltd, 2021.

### REFERENCES

- Books That Lecture Operations Research [Facts-Based Approach], Venant R.N. Mutabihirwa,2022.
- Applied Mathematics with Open-Source Software: Operational Research Problems with Pythonand R,Vincent Knight, Geraint Palmer, Chapman and Hall/CRC, 2022
- Operations Research Fundare Models: Part 1 [Fourth Edition] of Fundamentals of OperationsResearch,Venant R.N. Mutabihirwa, 2022.
- Inventory Control (International Series in Operations Research & Management Science), SvenAxsater,Springer, 2016.
- The Handbook of Behavioral Operations Management: Social and Psychological Dynamics inProductionand Service Settings, Bendoly, Wezel, Bachrach, Oxford University Press, 2015.

### E-RESOURCES

- <https://www.classcentral.com/course/swayam-operations-research-14219>
- <https://www.coursera.org/courses?query=operations%20research>
- <https://www.edx.org/course/operations-research-an-active-approach>
- [https://onlinecourses.nptel.ac.in/noc19\\_ma29/preview](https://onlinecourses.nptel.ac.in/noc19_ma29/preview)
- <https://alison.com/tag/operations>

### COURSE OUTCOMES

On completion of this course, the students will be able to

- Analyze any real life system with limited constraints and depict it in a model form.
- Convert the problem into a mathematical model.
- Solve the mathematical model manually.
- Understand variety of problems to make effective business decisions using assignment, transportation, travelling salesman etc.
- Develop a report that describes the model and the solving technique, analyse the results and propose recommendations in language understandable to the decision-making processes.

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SEMESTER III:

CORE COURSE- XIII

OPERATIONS RESEARCH (P22MBACC33) MAPPING

CO - PO – PSO matrices of course

K1: Low K2: Moderate K3: Substantial

PO/PSO	PO1	PO2	PO3	PO4	PO5
<b>CO</b>					
<b>P22MBACC33</b>	3	3	3	3	2
<b>P22MBACC33</b>	3	3	2	3	3
<b>P22MBACC33</b>	3	3	2	3	2
<b>P22MBACC33</b>	3	3	3	3	2
<b>P22MBACC33</b>	3	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director

## **EXPORT MANAGEMENT**

**Second Year**

**Semester – III**

**Non-Major Elective – II**

**Credit - 2**

**Code: P22MBANME2**

### **COURSE OBJECTIVES**

- To impart the meaning of Export Management
- To understand the concept nature and functions of Export management its pricing and costing decisions
- To discuss Export Management promotion council and industrial parks

### **UNIT – I**

Introduction - Composition of Exports – Traditional and non-traditional products – principle products of export, Direction of Export Trade – Export potential analysis in agricultural products, marine products, Textiles, engineering goods – software and information technology.

### **UNIT – II**

Product planning – managerial skills - export planning objectives, programming – organisation – building a team executive action – management control - designing products for export - product positioning in overseas markets - new product planning for export markets.

### **UNIT – III**

Export services – product servicing tourism software and IT enabled services – financial services – deemed services – product and service organization. Exim Bank – advisory services - effects on exports. GATT - WTO.

### **UNIT – IV**

Export pricing and costing decisions – factors influencing pricing – export costing – breakeven point – export offer quotation – export contract pricing strategies marginal costing and export pricing – transfer pricing exchange rates – forward contracts.

### **UNIT – V**

Export promotion council / organisations – export oriented industrial parks – FIEO, IIFT, IIP, ICA, ITPO, STC, MMTC, FTC-100% export oriented units India's export potential - Abdul Kalam's vision of 2020- international comparisons and India's export target.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary Developments Related to Export Management - Studying: export contract pricing strategies marginal costing and export pricing. Group Discussion on Export potential analysis in agricultural products.

### TEXT BOOKS

1. S. Ramakrishana, Quality Control and Pre-Shipment Inspection for Exports, AI Exim Bank Publications, 2018.
2. International Trade & Export Management: Francis Chernutrilam, Himalaya Publishing House, 2019.
3. Global Business Today, Charles W.L., Hill McGraw and Hill Irwing, 2019.
4. International Business Francis Chernutrilam Victor Luis Anthuvan, (EEE) PHI New Delhi, 2017.
5. International Financial Management, Madhu Vij, Excel Books, 2016.

### REFERENCES

1. TAS Baragopal, Export Management, Himalaya Publishing House, 2018.
2. Foreign Exchange Manual, RBI
3. Thomas A. Cook, Mastering Import & Export Management, AMACOM, 2021.
4. Richard Harrison, The Export Gardener: A Clumsy Australian Starts a Gardening Business in the UK, 2019.
5. Bade, D. Export/Import Procedures and Documentation (Fifth ed.). AMACOM, 2016.

### E-RESOURCES

1. <http://www.customs.gov.au/site/>
2. [www.eximbankindia.com](http://www.eximbankindia.com)
3. <http://india.vishaq.in/customs/>
4. <http://www.wto.org/>
5. <http://www.imf.org/external/index.htm>

### COURSE OUTCOMES

On completion of this course, the students will be able to:

1. Explain the concepts of trade documentation in international business.
2. Understand product servicing tourism software and IT enabled services
3. Integrate concepts of international business with functioning of global trade
4. Understand the difference existing in Domestic Market & Export Market
5. Develop knowledge about international markets and India's export target

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**SEMESTER III:**

**NON-MAJOR ELECTIVE -II**

**EXPORT MANAGEMENT (P22MBANME2)MAPPING**

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO</b>					
<b>P22MBANME2</b>	3	3	3	3	2
<b>P22MBANME2</b>	3	3	2	3	3
<b>P22MBANME2</b>	3	3	2	3	2
<b>P22MBANME2</b>	3	3	3	3	2
<b>P22MBANME2</b>	3	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director

## DIGITAL MARKETING

**Second Year**  
**Elective course**

**Semester – III**  
**Credit - 4**

**A: marketing**  
**Code: P22MBA3EM1**

### **COURSE OBJECTIVES**

1. To impart knowledge of key trends within the digital marketing landscape.
2. To create an awareness about the holistic impact of all Digital Marketing channels.
3. Examine an example of each Digital Marketing channel.

### **UNIT – I INTRODUCTION OF THE DIGITAL MARKETING**

Digital vs. Real Marketing - Digital Marketing Channels - Understanding marketing through the internet - Definition of digital marketing; origin of digital Marketing - Benefits of Digital marketing.

### **UNIT – II INTERNET ENVIRONMENT**

The internet micro- and macro-environment, Internet users in India. The internet marketing mix: product and branding. Digital marketing tools/e-tools. Online marketing matrix including business and Consumer markets.

### **UNIT – III DIGITAL MARKETING COMMUNICATIONS USING INTERNET**

Search engine marketing (SEM): Definition of SEM, definition of search Engine- Optimization (SEO); advantages and disadvantages of SEO; best practice in SEO - Paid search engine marketing, pay per click advertising (PPC); landing pages; long Tail concept and email Marketing

### **UNIT – IV DESIGN A DIGITAL MARKETING PLAN**

SWOT, situational analysis, key performance Indicators in internet marketing, Digital Landscape, P-O-E-M Framework - Segmenting and Customizing - Digital Advertising Market in India.

### **UNIT – V OBJECTIVES OF SOCIAL MEDIA**

Introduction to social media - how to build a successful Social Media Strategy, Goal setting, Strategy and implementation - Measure and Improvement. Social Media Trends - Listening to Market. Digital Marketing Trends - Branding on the Net - Branding your Website, Trends in Digital Advertising.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary Developments Related to Digital Marketing – Studying Search engine marketing and digitalmarketing tools  
– Mini project on social media marketing- Group Discussion.

### TEXT BOOKS

1. Puneet Singh Bhatia, Fundamentals of Digital Marketing, Pearson Education, 2017.
2. Vandana Ahuja, Digital Marketing, Oxford University Press, 2016.
3. Philip Kotler, Marketing 4.0: Moving from Traditional to Digital, Wiley, 2019.
4. Ryan. D., Understanding Digital Marketing: Marketing Strategies for Engaging the DigitalGeneration,Kogan Page Limited, 2020.
5. Pulizzi.J, Beginner's Guide to Digital Marketing, Mcgraw Hill Education, 2016.

### REFERENCES

- Barker, Barker, Bormann and Neher, Social Media Marketing: A Strategic Approach, 2E South-Western,Cengage Learning, 2017.
- Ryan Deiss and Russ Henneberry, Digital Marketing for Dummies Paperback, Wiley, 2020.
- David Meerman Scott, The New Rules of Marketing and PR: How to Use Social Media, Online Video,Mobile Applications, Blogs, News Releases, and Viral Marketing to Reach Buyers Directly, 2018.
- Eric Enge, Stephan Spencer and Jessie Stricchiola, Art of SEO 3/ed Mastering Search EngineOptimization, Shroff/ O'Reilly, 2016.
- Joe Pulizzi, Epic Content Marketing: How to Tell a Different Story, Break through the Clutter, andWinMore Customers by Marketing Less, McGraw Hill, 2020.

### E-RESOURCES

- <https://collegedunia.com/courses/seo/seo-courses-on-udemy>
- <https://collegedunia.com/courses/social-media-marketing/udemy-social-media-marketing>
- <https://collegedunia.com/courses/google-ads>
- <https://collegedunia.com/courses/google-analytics>
- <https://collegedunia.com/courses/web-designing>

### COURSE OUTCOMES

On completion of this course, the students will be able to

1. Understand the basics of the digital marketing tool kit
2. Understand the impact of marketing through digital platform.
3. Become familiar with the elements of the digital marketing channel
4. Understand how they can use digital marketing to increase sales.
5. Understand how to reach the online target market with proper marketing channel

**I-DIGITAL MARKETING(P22MBA3EM1)MAPPING****CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

PO/PSO	PO1	PO2	PO3	PO4	PO5
<b>CO</b>					
P22MBA3EM1	3	3	3	3	2
P22MBA3EM1	3	3	2	3	3
P22MBA3EM1	3	3	2	3	2
P22MBA3EM1	3	3	3	3	2
P22MBA3EM1	3	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director

## **BRAND MANAGEMENT**

**Second Year**  
**Elective course**

**Semester – III**  
**Credit - 4**

**A: marketing**  
**Code: P22MBA3EM2**

### **COURSE OBJECTIVES**

1. Familiarize brand concepts and purpose of branding.
2. Describe the process and methods of brand management.
3. Familiarize brand identity and build brand equity

#### **UNIT – I**

Brand – Definition, Scope, Objectives, Brand Management concept. Product Management – Basic Concepts, Classification of Products- consumers and industrial product, Difference between products and services - Role of a Product Manager, Responsibilities of a Product/Brand Manager - Organizing the Brand Management system.

#### **UNIT – II**

Branding - Strategic changes to gain competitive advantage through branding, Brand vs. Product, Concept of brand equity, brand element, Customer based brand equity model. Brand Positioning and values –Brand Identity, Brand Image, Brand personality, Brand extension, Brand equity and Brand loyalty. How to build strong brand in Indian context with examples.

#### **UNIT – III**

Brand Marketing programs – brand elements, options and tactics, designing marketing programs, Integrating Marketing Communication to build brand equity. Branding Strategies- Evaluation of Brands, Perceived Quality; Brand Positioning and Repositioning with examples.

#### **UNIT – IV**

Brand Equity Measurement Systems- Brand Audits, establishing a Brand Equity Management System; Matrix, Brand Hierarchy, designing a Branding Strategy; Brand Extension, Evaluating Extensions and Opportunities; Adjustments to brand portfolio; Reinforcing and Revitalizing Brands, Brand Portfolio - Managing Brands over Geographical Boundaries, Cultures and Market Segments.

#### **UNIT – V**

Measuring and interpreting brand performance – Analyzing customer mindset and measuring market performance Co-branding, Range brands.



## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary Developments Related to Brand Marketing - Practical: Discuss about issues facing a modern day brand manager and their solutions – Studying brand positioning techniques – Group Discussion.

### **TEXT BOOKS**

1. B2B Brand Management, Philip Kotler, Waldemar Pfoertsch, Springer, 2018.
2. Strategic Brand Management for B2B Markets, Sharad Sarin, SAGE, 2015.
3. Brand Management, Anish John A, C.K. Madhusoodhanan, Thakur Publication Pvt. Ltd., 2022.
4. Product and Brand Management, U. C. Mathur, Excel Books, 2015.
5. Product and Brand Management, Ameya Anil Patil, Nirali Prakashan, 2020.

### **REFERENCES**

1. The Culting of Brands, Penguin Group (USA) Incorporated, Douglas Atkin, 2014
2. Brand Bible: The Complete Guide to Building, Designing and Sustaining Brands, Debbie Millman, Rockport Publishers, Beverly, USA, 2015.
3. Branded in History: Fresh Marketing Lessons from Vintage Brands, Ramya Ramamurthy, Hachette India, 2021.
4. Brand Portfolio Strategy: Creating Relevance, Differentiation, Energy, Leverage, and Clarity, David A. Aaker, Free Press, 2020.
5. Brand Wars: Combat Strategies for Indian Brands, Rajiv Gupte, Anand Limaye, SAGE Publications, 2021

### **E-RESOURCES**

1. <https://www.classcentral.com/course/brand-3929>
2. <https://www.mygreatlearning.com/academy/learn-for-free/courses/brand-management>
3. <https://www.coursera.org/learn/brand>
4. <https://www.hubspot.com/resources/branding>
5. <https://www.edx.org/learn/brand-engagement>

### **COURSE OUTCOMES**

On completion of this course, the students will be able to:

1. Develop a strategic brand equity business plan based on an accurate analysis of a business situation.
2. Evaluate the customer environment for new and existing brands and build this customer focus into brand strategy in unpredictable and complex contexts.
3. Understand how branding is applied in practical situations by studying real-life examples.
4. Learn about the step-by-step process and various strategies involved in brand management, with a focus on establishing a strong brand identity and building brand equity.
5. Evaluate the performance and situation of a brand for the purpose of recommending future strategies.

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**SEMESTER III:**

**ELECTIVE COURSE A: MARKETING**

**II- BARND MANAGEMENT. (P22MBA3EM2)MAPPING**

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO</b>					
P22MBA3EM2	3	3	3	3	2
P22MBA3EM2	3	3	2	3	3
P22MBA3EM2	2	3	2	3	2
P22MBA3EM2	2	2	3	3	2
P22MBA3EM2	3	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director

### III CONSUMER BEHAVIOUR

**Second Year**  
**Elective course**

**A: marketing**  
**Code: P22MBA3EM3**

**Semester – III**  
**Credit - 4**

#### **COURSE OBJECTIVES**

1. To understand consumer behaviour in an informed and systematic way.
2. To analyse personal, socio-cultural, and environmental dimensions that influence consumer decisions making.
3. To enable students in designing and evaluating the marketing strategies based on fundamentals of consumer buying behaviour.

#### **UNIT – I CONSUMER BEHAVIOUR – AN INTRODUCTION**

Consumer Behaviour – meaning, definition, Significance. Consumer behavior principles to strategic marketing. Role of Marketing in Consumer behavior. Applications of consumer behavior knowledge in marketing.

#### **UNIT – II CONSUMER AS AN INDIVIDUAL**

Consumer needs and motivation, Personality and Consumer Behaviour, Psychographics Consumer Perception, attitudes, attitude formation and change, Concept and measurement of attitudes. Learning.

#### **UNIT – III CONSUMER IN A SOCIAL & CULTURAL SETTING**

Group dynamics and consumer reference groups, Family, Social class and Consumer behaviour, The influence of Culture on Consumer behaviour. Sub – Cultural and Cross Cultural Consumer Analysis.

#### **UNIT – IV CONSUMER DECISION MAKING PROCESS**

Personal influence and the opinion leadership. Diffusion of innovation process, Consumer Decision making process, Comprehensive models of consumer decision making. New Product purchase and repeat purchase.

#### **UNIT – V CONSUMER BEHAVIOUR APPLICATIONS**

Consumer Behaviour applicable to Profit and Non Profit Organizations, Marketing Ethics, Consumer movement, Consumer protection in India.

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)** Contemporary Developments Related to Consumer Behavior – Practical: Studying culture and social factors affecting consumer behavior – Mini project on Consumer behavior on profit and non-profit organization – Group discussion.

### **TEXT BOOKS**

1. Consumer Behaviour, Leon G. Schiffman & Leslie Lazar Kanuk, Pearson Education Asia, New Delhi (12th Edition), 2019
2. Consumer Behaviour, S. Ramesh Kumar Leon Schiffman, Leslie Lazar Kanuk, 11th Edition, Pearson, 2015.
3. Consumer Behaviour in marketing, Howard, John A, Englewood Cliffs, Prentice Hall Inc, New Jersey, 2017
4. Consumer Behaviour, Mowen, John C., MacMillan, New York, 2016.
5. Consumer Behaviour, CL Tyagi and Arunkumar, Atlantic publishers, 2018.

### **REFERENCES**

- Consumer Behaviour, Ramanuj Majumdar PHI learning PVT Ltd., 2015.
- Consumer behaviour, India Edition, Jay D. Lindquist and M. Joseph Sirgy, Cengage learning, 2014.
- Consumer behaviour, concepts, Applications and cases – MS Raju, Dominic Xardel, Vikas publishing House PVT Ltd., 2017.
- Consumer Behaviour, By David L. LOUDON Albert J. Della Bitta – India Edition Tata Mcgraw Hill. Co, 2016.
- Consumer Behaviour, John C. Mower & Michael Minor, Prentice Hall, New Delhi, 2016.

### **E-RESOURCES**

1. <https://www.edx.org/course/consumer-behaviour>
2. <https://www.classcentral.com/course/swayam-consumer-behaviour-7901>
3. <https://iimbx.iimb.ac.in/catalog/consumer-behaviour/>
4. <https://www.futurelearn.com/courses/consumer-behaviour-and-psychology>
5. <https://www.udemy.com/course/consumer-behavior-r/>

### **COURSE OUTCOMES**

On completion of this course, the students will be able to:

1. Demonstrate how knowledge of consumer behaviour can be applied to marketing.
2. Awareness of socio-cultural factors (e.g., cultural norms, social class, reference groups) that impact consumer decisions.
3. Relate internal dynamics such as personality, perception, learning motivation and attitude to the choices consumers make.
4. Designing pricing strategies that consider consumer perceptions and preferences.
5. Evaluating and adapting marketing strategies based on consumer feedback and market dynamics.

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**SEMESTER III:****ELECTIVE COURSE A: MARKETING****II-CONSUMER BEHAVIOUR (P22MBA3EM3)****MAPPING****CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO</b>					
P22MBA3EM3	3	3	3	3	2
P22MBA3EM3	3	3	2	3	3
P22MBA3EM3	2	3	2	3	2
P22MBA3EM3	3	3	3	3	2
P22MBA3EM3	2	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director

## STRATEGIC FINANCIAL MANAGEMENT

**Second Year**

**Elective course**

**B: finance**

**Code: P22MBA3EF3**

**Semester – III**

**Credit - 4**

### **COURSE OBJECTIVES**

- To develop the ability to analyze financial statements, assess financial health, and formulate comprehensive financial plans to support the organization's strategic goals.
- To understand the principles of capital budgeting and learn to evaluate investment opportunities, assess risk, and make optimal capital investment decisions.
- To acquire skills in budgeting, variance analysis, and performance measurement to effectively monitor financial performance and control costs.

### **UNIT – I**

Financial Policy and Strategic Planning – Strategic Planning Process – Objectives and Goals – Major Kinds of Strategies and Policies – Corporate Planning – Process of Financial Planning – Types of Financial Plan – Financial Models – Tools or Techniques of Financial Modelling – Types, Application, Uses and Limitations of Financial Models – Process of Financial Model Development.

### **UNIT – II**

Investments Decisions under Risk and Uncertainty – Techniques of Investment Decision – Risk Adjusted Discount Rate, Certainty Equivalent Factor, Statistical Method, Sensitivity Analysis and Simulation Method – Corporate Strategy and High Technology Investments.

### **UNIT – III**

Expansion and Financial Restructuring – Corporate Restructuring - Mergers and Amalgamations – reasons for Merger, Benefits and Cost of Merger – Takeovers – Business Alliances – Managing an Acquisition – Divestitures – Ownership Restructuring – Privatization – Dynamics of Restructuring – Buy Back of Shares – Leveraged Buy-outs (LBOs) – Divestiture – Demergers.

### **UNIT – IV**

Stock Exchanges: Constitution, control, functions, Prudential Norms, SEBI Regulations, Sensitive Indices, Investor Services, Grievance Redressal Measures.

### **UNIT – V**

Financing Strategy - Innovative Sources of Finance – Asset Backed Securities - Hybrid Securities namely Convertible and Non-Convertible Debentures, Deep Discount Bonds, Secured Premium Notes, Convertible Preference Shares – Option Financing, Warrants, Convertibles and Exchangeable Commercial Paper.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary Developments Related to Strategic Financial Management - Practical: Studying Business Alliances, Managing an Acquisition, Divestitures and Ownership Restructuring - Mini Project on Innovative Sources of Finance - Group discussions.

### TEXT BOOKS

1. Chandra, Prasanna, Financial Management, Tata McGraw Hill, Delhi. 2017
2. S Gurusamy, Financial Markets and Institutions, Thomson, 2019
3. Rajni Sofat & Preeti Hiro, Strategic Financial Management, Phi, Delhi, 2019
4. Weaver & Weston, Strategic Corporate Finance, Cengage Learning, Delhi, 2021
5. Blokdyk, G. Strategic financial management Third Edition. 5 STARCOoks, 2022.

### REFERENCES

- Shil, N. C., & Das, B. Financial Management: A Strategic Perspective (First ed.). SAGE Publications Pvt. Ltd, 2019.
- Bryce, H. J. Financial and Strategic Management for Nonprofit Organizations, Fourth Edition (4th ed.). DeG Press, 2017.
- Kumar, R. Strategic Financial Management Casebook (1st ed.). Academic Press, 2016.
- Ness, T. Strategic Financial Management. Willford Press, 2016.
- Marsh, C. Financial Management for Non-Financial Managers (Strategic Success) (1st ed.). KoganPage, 2022.

### E-RESOURCES

- <https://www.mygreatlearning.com/academy/learn-for-free/courses/strategic-management>
- <https://www.coursera.org/courses?query=financial%20management>
- <https://www.edx.org/learn/financial-management>
- <https://www.elearnmarkets.com/courses/display/strategic-financial-management>
- <https://www.wiziq.com/course/166895-strategic-financial-management>

### COURSE OUTCOMES

On completion of this course, the students will be able to

- Identify financial strengths and weaknesses, enabling the formulation of strategic financial plans to address challenges and capitalize on opportunities.
- Identify and prioritize investment projects based on their strategic alignment, financial feasibility, and potential impact on the organization's growth and profitability.
- Conduct financial forecasting and scenario analysis to support long-term planning and align financial strategies with the organization's strategic goals.
- Conduct variance analysis to compare actual financial performance against budgeted figures, identifying areas of concern or areas where the organization is excelling.
- Understand and use alternative expressions of profit that start with a recognition of the impact on cash flow of the various stakeholders in a company

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**SEMESTER III****ELECTIVE COURSE B: FINANCE****III- STRATEGIC FINANCIAL MANAGEMENT (P22MBA3EF3)MAPPING****CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO</b>					
P22MBA3EF3	3	3	3	3	2
P22MBA3EF3	3	3	2	3	3
P22MBA3EF3	2	3	2	3	2
P22MBA3EF3	2	1	3	3	2
P22MBA3EF3	3	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director



## FINANCIAL SERVICES

**Second Year**  
**Elective course**

**Semester – III**  
**Credit - 4**

**B: finance**  
**Code: P22MBA3EF4**

### **COURSE OBJECTIVES**

- Familiarize participants with the basics of financial services, including the functions of financial institutions, markets, and intermediaries.
- Understand the regulatory framework governing financial services, including relevant laws, compliance requirements, and the role of regulatory authorities in maintaining financial stability and consumer protection.
- Equip the students with required proficiency to enable them to work in banks and insurance companies.

### **UNIT – I**

Evolution of Financial Services – Indian Financial System – Formal Financial System and Informal Financial System – Financial Institutions – Banking Companies and Non-Banking Companies – Classification of Non-Banking Companies – Classification of Activities of Non-Banking Finance Companies- Fund Based Activities – Fee Based Activities – concepts, growth and trends of fee Based and Fund Based activities

### **UNIT – II**

Equipment Leasing: Overview, Legal & Tax Aspects, Lease Evaluation, Lease Accounting, Recent Development, International Leasing.

### **UNIT – III**

Hire Purchase & Consumer: Overview, Financial Evaluation of Hire Purchase, Accounting of Hire Purchase, Legal & Tax Aspects, Consumer Credit.

### **UNIT – IV**

Accessing Capital Market: Issue Management: Regulatory & Tax Framework, Issue Pricing Models – Equity and Debt Convertible Instruments, Financial Engineering, raising funds from the International Capital Markets, Assessing Money Markets.

### **UNIT – V**

Organization and functions of stock exchanges - regulation and control of stock exchanges - NSE, BSE, OTCEI, regional exchanges.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary Developments Related to Financial Services- Practical: Studying Legal & Tax Aspects, Lease Evaluation and Lease Accounting - Mini Project on Financial Engineering, Raising funds from the International Capital Markets - Group discussions.

### TEXT BOOKS

1. Financial services M.Y Khan, Tata mcgraw Hill co., 2019.
2. Bhalla V.K. Management of Financial Services, Anmol. New Delhi, 2016.
3. Financial Services By Dr. S. Gurusamy Tata Mcgraw Hill Co, 2019.
4. Financial Services, By Nalini Prava Tripathy, PHI learning PVT ltd., 2017.
5. Financial markets, Institutions & Services by NK Gupta and Monika Chopra – Ane books Pvt Ltd., 2021.

### REFERENCES

- Financial markets and Institutions by Jeff Madura, India Edition, Cengage Learning, 2016.
- Stevens, C. Execute 90: Financial Services Edition. Bowker, 2021.
- Tapscott, A. Financial Services Revolution: How Blockchain is Transforming Money, Markets, and Banking (Blockchain Research Institute Enterprise Series) (None ed.). Barlow Publishing, 2020.
- Arslanian, H., & Fischer, F. The Future of Finance: The Impact of FinTech, AI, and Crypto on Financial Services (1st ed. 2019 ed.). Springer, 2019.
- Duran, E. R. Financial Services Technology: Processes, Architecture, and Solutions, 2nd Edition (2nd ed.). Cengage Asia, 2017.

### E-RESOURCES

- <https://www.edx.org/learn/finance>
- <https://alison.com/tag/finance>
- <https://corporatefinanceinstitute.com/collections/>
- <https://study.com/academy/popular/free-online-finance-courses-certificates.html>
- <https://pll.harvard.edu/subject/finance>

### COURSE OUTCOMES

On completion of this course, the students will be able to

- Demonstrate broad and coherent knowledge of banking, finance, investment analysis, portfolio management, accountancy, economics, quantitative methods, law, and financial services.
- Exercise informed business judgement within a professional setting, which emphasises ethical and responsible decision making.
- To integrate technical and conceptual knowledge, and interpersonal skills to work effectively within the Financial Services Industry.
- Apply financial and regulatory knowledge in real-world scenarios, making informed decisions and provide valuable services to customers in the banking.
- Think critically and creatively, to identify better solutions, within business constraints

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IV- FINANCIAL SERVICES (P22MBA3EF4)  
MAPPING

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
P22MBA3EF4	3	3	3	3	2
P22MBA3EF4	3	3	2	3	3
P22MBA3EF4	2	3	2	3	2
P22MBA3EF4	2	1	3	3	2
P22MBA3EF4	3	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director

## SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

**Second Year**  
**Elective course**

**Semester – III**  
**Credit - 4**

**B: finance**  
**Code: P22MBA3EF5**

### **COURSE OBJECTIVES**

- Introduce students to stock market, stock options, and approaches to investing in the stock market and building stock portfolios.
- Provide students with a basic introduction to portfolio theory and study various methods of modeling the risk associated with stock investment.
- Encourage students to apply stock and option valuation models in portfolio management.

### **UNIT – I**

Calculation of Bond returns. Valuation of Bonds: Measures of Yield, Duration & Convexity, Measures of Risk, Determinants of Interest Rates and Theories on Term Structure, Bond Swaps.

### **UNIT – II**

Derivative Securities: Equity Options: Concept, Applications & Valuation, Economic Analysis, Industry Analysis.

### **UNIT – III**

Valuation of Equity Stocks: Approaches of Equity Stock Valuation, Index features, concept, applications and valuation.

### **UNIT – IV**

Valuation of Equity Stocks: Company Analysis, Technical Analysis, Efficient Markets Hypothesis.

### **UNIT – V**

Portfolio Management – The Conceptual Framework: Modern Portfolio Theory, Portfolio Management, Performance Evaluation of Portfolio, Applications of Options & Futures in Portfolio Management.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary Developments Related to the portfolio analysis - Practical: mock online trading, Mockportfolio construction, Group Discussion, Role Play.

### TEXT BOOKS

1. Security Analysis and Portfolio management By Punithavathy Pandian, Vikas publishing HousePVTLtd., 2016.
2. Security Analysis and Portfolio Management with CAPM – By Dr. Sankara Narayanan – ANEBooksChennai, 2019.
3. Security Analysis and Portfolio Management by RITTU Ahuja, Atlantic publishing Co., 2017.
4. Portfolio Management By Samir K. BARUA and others, Tata Mcgraw Hill, 2021.
5. Security Analysis and Portfolio Management, By S. Kevin, PHI learning PVT Ltd., 2022.

### REFERENCES

- Investments, Special Indian Edition by ZVI Bodie and others Tata Mcgraw Hill, 2015.
- Fundamentals of Investment Management Indian Edition, By HIRT and Block Tata Mcgraw HillCo.,2016.
- Investment Management, By Vk. Bhalla S.Chand & Co., 2019.
- Investment Analysis and Portfolio Management By Prasanna Chandra, Tata Mcgraw Hill Co.,2021.
- I., P. B., & R., A. Security Analysis and Portfolio Management: Investment, Fundamental SecurityAnalysis, Portfolio Management. LAP LAMBERT Academic Publishing, 2021.

### E-RESOURCES

- <https://www.classcentral.com/course/swayam-security-analysis-portfolio-management-43656>
- [https://onlinecourses.nptel.ac.in/noc21\\_mg99/preview](https://onlinecourses.nptel.ac.in/noc21_mg99/preview)
- <https://freevidelectures.com/course/3012/security-analysis-and-portfolio-management>
- <https://www.udemy.com/course/securityanalysisportfoliomangement/>
- <https://www.nseindia.com/learn/self-study-ncfm-modules-intermediate-investment-analysis-and-portfolio-management>.

### COURSE OUTCOMES

After completion of this course, the student will be able to

- Explore different avenues of investment.
- To understand security analysis.
- Apply the concept of portfolio management for better investment.
- Invest in less risk and more return securities.
- Analyze and evaluate portfolio performance.

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## V. SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT(P22MBA3EF5)MAPPING

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

PO/PSO	PO1	PO2	PO3	PO4	PO5
<b>CO</b>					
P22MBA3EF5	3	3	3	3	2
P22MBA3EF5	3	2	2	3	3
P22MBA3EF5	2	3	2	3	2
P22MBA3EF5	2	3	3	3	2
P22MBA3EF5	3	1	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director

## **ORGANIZATION DEVELOPMENT**

**Second Year**

**Elective Course**

**C: Human Resource Management**

**Code: P22MBA3EH3**

**Semester – III**

**Credit - 4**

### **COURSE OBJECTIVES**

- To understand the basic theories upon which the field of OD rests.
- To understand the challenges of Structural Interventions
- To understand all aspects of the OD intervention process

### **UNIT- I THE NATURE OF ORGANIZATION DEVELOPMENT**

Overview of the Field of Organization Development: Laboratory Training, Survey Research and Feedback, Action Research, Socio-technical and Socio-clinical approaches Values and Assumptions and Beliefs in OD: OD Values and Assumptions, Implications of OD and Assumptions

### **UNIT –II THEORY AND MANAGEMENT OF OD**

Foundations of Organization Development: Models and Theories of Planned Change, Systems Theory, Participation and Empowerment, Teams and Teamwork, Managing the OD Process: Diagnosis, Action Component – OD Interventions,

### **UNIT-III TEAM, INTERGROUP AND THIRD-PARTY PEACEMAKING INTERVENTIONS**

Overview of OD Interventions: Classifying OD Interventions Team Interventions: Teams and Work Groups, Broad Team-Building Interventions, Process Consultation Interventions

### **UNIT-IV COMPREHENSIVE OD INTERVENTIONS AND STRUCTURAL INTERVENTIONS**

Survey Feedback, Grid Organization Development, Schein Cultural System, Trans- organizational Development Structural Interventions: MBO, Quality Circles, TQM, High Performance Work Systems

### **UNIT-V T-GROUP TRAINING**

T-Groups, Behaviour Modeling, Life and Career Planning. Coaching and Mentoring Future and Organizational Development.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary issues Related to the Organizational development- Practical: Studying Developing Process inorganizing - Mini Project on Individual behavior in organization - practices in MNCs - roleplay, Group discussion

### TEXT BOOKS

1. Nilakant, V. and Ramnaryan, S., Managing Organisational Change, Response Books, NewDelhi,2021.
2. Beckhanrd, Richard and Harris, Reuben T., Organisational Transitions :Managing Complex Change, Addison, - Wesley,2020.
3. Kanter, R.M., Stein, B.A and Jick, T.D., The Challenge of Organisational Change, Free Press,New York,2015 .
4. Hammer, Michael and Champy, James, Reengineering the Corporation : A Manifesto for Business Revolution, Harper BusOiness, New York ,2017.
5. Hurst , David K., Crisis and Renewal : Meeting the Challenge of Organisational Change, HarvardUniversity Press, Mass,2018.

### REFERENCE BOOKS

- Pattanayak, Biswajeet and Kumar Pravash, Change for Growth in Organisation, WheelerPublications,New Delhi,2021
- Morgan, Gareth, Imagination, Response Books, New Delhi ,2020.
- Madhukar Shukla, Competing Through knowledge, Response Books, New Delhi,2018.
- Storey, John, International Cases in Human Resources Mangement, BeaconBooks, New Delhi,2019.
- Venkataratnam C.S., Varma, Anil (ed): Challenge of Change: IndustrialRelations in IndianIndustry:Allied Pub. Ltd., New Delhi ,2018.
- Kavitha Singh Organisational change and Development, Excel Books NewDelhi,2015.

### E-RESOURCES

- <https://www.coursera.org/courses?query=organizational%20development>
- <https://www.udemy.com/course/thinking-profoundly-about-organisational-development/>
- <https://alison.com/course/organizational-change-managing-and-supporting-employees- revised>
- <https://www.classcentral.com/course/swyam-organization-development-and-change-in-21st-century-19963>
- <https://www.futurelearn.com/courses/essential-elements-od>

### COURSE OUTCOMES

On completion of this course, the students will be able to

- Analyze how these theories contribute to a deeper understanding of organizational behavior, change processes, and performance improvement.
- Identify and assess the various challenges and complexities associated with implementing structural interventions in organizations.
- Better understanding of change management model.
- Develop skills to facilitate and communicate OD interventions, considering stakeholder engagement andchange communication strategies.
- Better understanding of change resistance and how to handle it.



**SEMESTER III****ELECTIVE COURSE HUMAN RESOURCE MANAGEMENT****ORGANIZATION DEVELOPMENT(P22MBA3EH3)****MAPPING****CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO</b>					
P22MBA3EH3	2	3	3	3	2
P22MBA3EH3	3	3	2	3	3
P22MBA3EH3	3	1	2	3	2
P22MBA3EH3	2	2	3	3	2
P22MBA3EH3	3	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director

## COMPENSATION MANAGEMENT

Second Year

Semester – III

Elective Course

Credit - 4

**C: Human Resource Management**

**Code: P22MBA3EH4**

### COURSE OBJECTIVES

- Understand the concept and importance of compensation management.
- Analyze, integrate, and apply the knowledge to solve compensation related problems in organizations.
- Design rational and contemporary compensation systems in modern organizations.

### UNIT – I INTRODUCTION TO COMPENSATION CONCEPTS

Introduction to Compensation, Goals of Compensation System, Compensation Strategy, Monetary & Non- Monetary Rewards, Intrinsic Rewards, Cafeteria Style Compensation, Employees satisfaction and Motivation issue in compensation design. Establishing Internal, External and individual equally.

### UNIT – II ESTABLISHING PAY VARIABLES AND WAGE BOARDS

Strategic importance of variable in a day-Determination of Inter and Intra industry compensation differentials. Individual and Group Incentives.

### UNIT – III ISSUE RELATED TO COMPENSATION

Dearness Allowance Concept-Emergence & Growth in India. Fringe Benefits and Supplementary Compensation-The role of fringe benefits in reward systems, retirement Plans including VRS / Golden Handshake Schemes.

### UNIT – IV EXECUTIVE COMPENSATION

Executive Compensation Systems in Multinational Companies and IT companies including ESOP.

### UNIT - V COLLECTIVE BARGAINING AND EMERGING TRENDS

Collective Bargaining Strategies – Long term settlements – Productivity Settlements – Knowledge on drawing up 12(3) and 8(1) settlements. Emerging Trends in IR due to LPG.

**UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only) :** Contemporary issues Related to the Compensation Management - Practical: Studying Golden Handshake Schemes - Mini Project on wage system on IT sectors - Group discu

**TEXT BOOKS :**

1. Compensation, George T. Milovich and C.S. Venkatraman special Indian Edition, Tata McGrawHill, 2017.
2. Human Resource Management by C.B. Gupta sultanchand & sons, 2015.
3. Compensation Management Rewarding Performance, D.S. Upadhyay Global India Business Publications, 2018.
4. Compensation: Theory, Evidence and Strategic Implications, Barry Gerhart, Sage Publications, 2019.
5. Reward Management, White Geoff, Taylor and Francis, Atlantic Publishers, 2019.

**REFERENCES :**

1. Scaling Up Compensation: 5 Design Principles for Turning Your Largest Expense into a Strategic Advantage, Harnish, V., & Ross, S., Forbes Books, 2021.
2. The WorldatWork Handbook of Total Rewards: A Comprehensive Guide to Compensation, Benefits, HR & Employee Engagement (2nd ed.). WorldatWork, & Cafaro, D., Wiley, 2017.
3. Strategic Compensation and Talent Management: Lessons for Managers, DeVaro, J. Cambridge University Press, 2020.
4. Strategic Compensation: A Human Resource Management Approach (9th ed.), Martocchio, J., Pearson, 2016.
5. The Compensation Handbook, Sixth Edition: A State-of-the-Art Guide to Compensation Strategy and Design (6th ed.), Berger, L., & Berger, D., McGraw Hill, 2015.

**E-RESOURCES :**

1. <https://www.coursera.org/learn/compensation-management>
2. <https://www.mygreatlearning.com/academy/learn-for-free/courses/compensation-management>
3. <https://www.classcentral.com/course/managing-employee-compensation-5510>
4. <https://www.mooc-list.com/tags/compensation>
5. <https://www.udemy.com/course/certification-in-compensation-management-administration/>

## **COURSE OUTCOMES :**

On completion of this course, the students will be able to

- Develop a compensation strategy, that fits in with the company's strategic goals, supports its culture and its managerial strategy
- Describe the link between reward systems and compensation
- Determine compensation values to establish actual values for jobs and individual employees
- Design and implement performance-based compensation programs that link individual and team performance with rewards.
- Implications for strategic compensation and possible employer approaches to manage legally required benefits

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**SEMESTER III:**

**ELECTIVE COURSEC: HUMAN RESOURCE MANAGEMENT**

**COMPENSATION MANAGEMENT (P22MBA3EH4)**

**MAPPING**

**CO - PO – PSO matrices of course**

K1: Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBA3EH4	3	3	3	3	2
P22MBA3EH4	2	3	2	3	3
P22MBA3EH4	3	2	2	3	2
P22MBA3EH4	3	3	3	3	2
P22MBA3EH4	3	3	3	2	2
<b>Optimum point</b>	3	3	3	3	2



Signature of the Director

## CHANGE MANAGEMENT

Second Year

Elective Course

C: Human Resource Management

Code: P22MBA3EH5

Semester – III

Credit - 4

### COURSE OBJECTIVES

- Understand the nature and dynamics of organizational change.
- To provide students with clear insights on how to effectively motivate people through corporate culture on organizational change.
- To equip them with effective skills and knowledge for managing and communicating change.
- Recognize the role of HR in change management.
- Identify ways that can positively lead and motivate people through cultural or organizational change.
- Stay updated on emerging trends and best practices in change management.

### UNIT – I

Nature and Types of Organizational Change, Causes of and rationales for change, environmental and internal organizational determinants of change. Planned and emergent change. Proactive and reactive emergent change and response to these changes. Incremental and radical change, and rates / levels of change as a function of organizational life cycle positions. The links between nature / type of change and nature / type of leadership required e.g. transactional Vs transformational. The role of corporate vision and strategy in change

### UNIT – II

Theoretical frameworks, multi-source feedback for organizational change, Models of diagnosing organizational groups and jobs The organizational change web, Resistance to change, Barriers to organizational change, rethinking resistance to organizational change, strategies to deal with resistance.

### UNIT – III

Culture and the change process: The personnel manager as a cultural change agent, handling power and political issues arising from change. The theoretical and practical contexts of cultural maintenance and cultural change strategies, corporate reorganization and sub culture management, Strategies and methods for achieving cultural change.

### UNIT – IV

Behavioral Implications of change: The manifest, intent and paradoxical consequences of change, the concept of resigned behavioral compliance. The positive and negative functions of resistance. Intended and unintended behavioural reaction to downsizing and delayering. Understanding and managing uncertainty and ambiguity in the change process.

### UNIT – V

Intervention Strategy, Structural, technological and process factors in intervention strategies. Advantages / limitations of change technologies and associated leadership models. Role of leadership in change process. Leadership and emotional knowledge strategies to achieve congruence of personnel, structure and culture. Trends and Challenges of leading change.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary issues Related to the Change Management - Practical: Studying role of leadership in change process - Mini Project on challenges faced by different industries in change management - Group discussion.

### TEXT BOOKS

1. Change Management, V. Nilakani and S. Ramnaryan, Sage, 2017.
2. Organizational change, Tupper cawsly and Gene Deszca, Sage, 2019.
3. Management of Organizational change, K. Harigopal, Sage, 2018.
4. Managing Organizational change, Indian Edition, Palmer /dunfordlakin, Tata Mcgraw Hill Co.,2017.
5. Change Management, Radha R. Sharma, Tata Mcgraw Hill. Co., 2016.

### REFERENCE

- The Theory and practice of change Management, By John Hayes, Palgrave Macmillan Co.,distributed by Ane books PVT Ltd., 2017.
- Agile Change Management: A Practical Framework for Successful Change Planning and Implementation(2nd ed.), Franklin, M. Kogan Page, 2021.
- HBR's 10 Must Reads on Change Management 2-Volume Collection, Harvard Business Review Press,2021
- The Hard and Soft Sides of Change Management: Tools for Managing Process and People (1sted.), Zukof,K., Association for Talent Development, 2021.
- Making Sense of Change Management: A Complete Guide to the Models, Tools and Techniques of Organizational Change (5th ed.), Cameron, E., & Green, M., Kogan Page, 2019

### E-RESOURCES

- <https://alison.com/course/introduction-to-change-management-revised>
- <https://www.edx.org/learn/change-management>
- <https://www.coursera.org/courses?query=change%20management>
- <https://www.mygreatlearning.com/academy/learn-for-free/courses/change-management>
- <https://www.mooc-list.com/tags/change-management>

### COURSE OUTCOMES

On completion of this course, the students will be able to

- Understand the fundamentals of managing change.
- How to help people deal with change more effectively, maintaining their commitment and bringing them successfully through the change process.
- Understand the various types of change that affect organisations, and know how to draw on a range of professional approaches to support the effective delivery of the organisation's desired outcomes from each change initiative.
- Learn to identify and work with the stakeholders in a change initiative, and how to plan, execute and measure the effective communications required to build and maintain their engagement.
- Learn to assess the impacts of change, to develop effective change teams and to recognise and address resistance to change.

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**SEMESTER III**

**ELECTIVE COURSE C: HUMAN RESOURCE MANAGEMENT**

**V- CHANGE MANAGEMENT (P22MBA3EH5)MAPPING**

**CO - PO – PSO matrices of course**

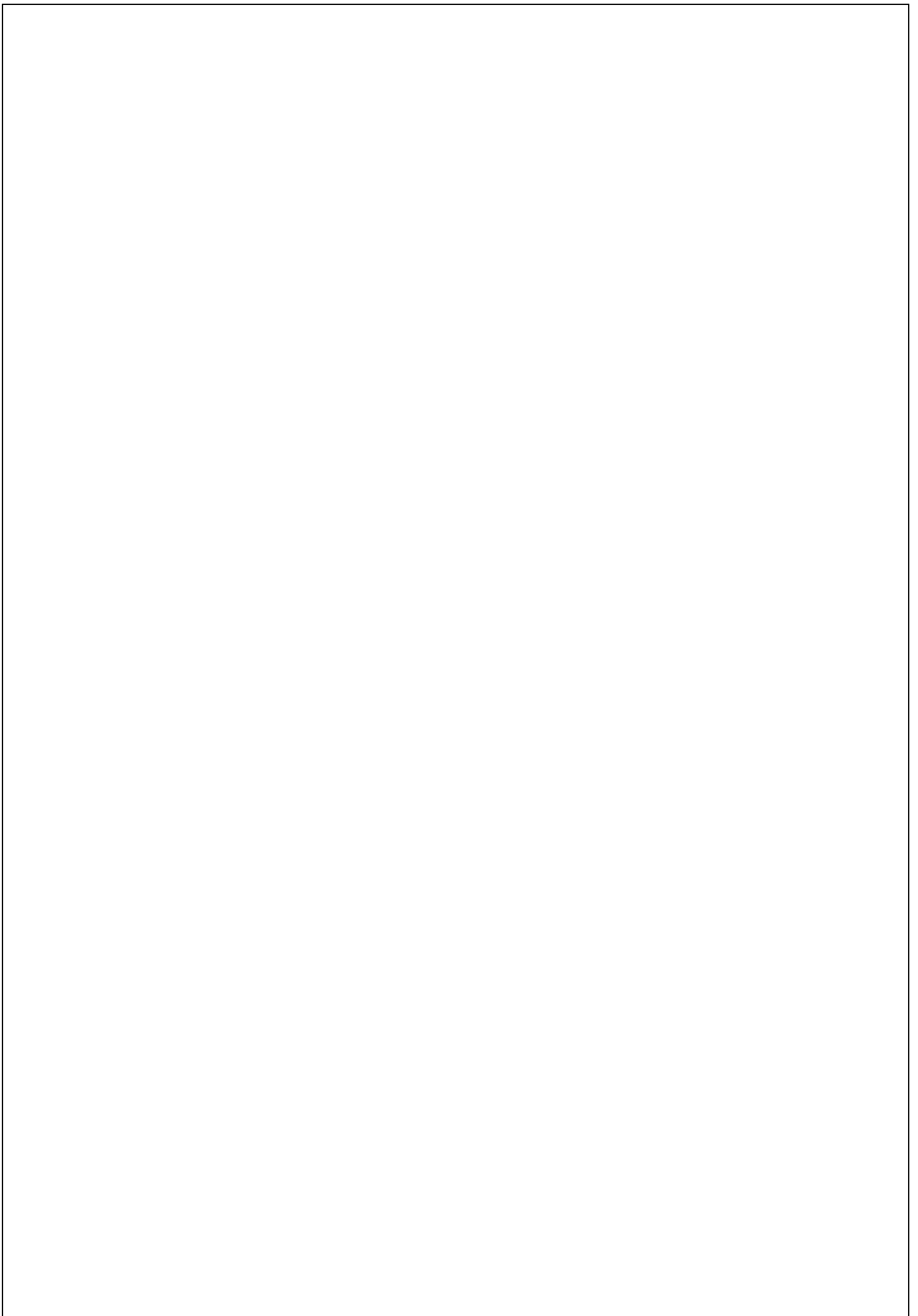
K1: Low K2: Moderate K3: Substantial

<b>PO/PSO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO</b>					
P22MBA3EH5	3	3	3	3	2
P22MBA3EH5	3	3	2	3	3
P22MBA3EH5	3	3	2	3	2
P22MBA3EH5	3	3	3	3	2
P22MBA3EH5	3	3	3	2	2
<b>Optimum Point</b>	3	3	3	3	2



Signature of the Director







**DEPARTMENT OF MANAGEMENT STUDIES  
(MBA – AICTE APPROVED)**

**MANAGEMENT INFORMATION SYSTEM**

**First Year**

**Code Course – VI**

**Code: P22MBACC21**

**Semester – II**

**Credit - 5**

**COURSE OBJECTIVES:**

- To describe the role of information technology and decision support systems in business
- To introduce the fundamental principles of computer-based information systems analysis
- To enable students, understand the various knowledge representation methods and different expert system structures as strategic weapons to counter the threats to business and make business more competitive

**UNIT – I I T TRENDS**

Information System – Concepts, Classification of IS, Computer hardware, Computer software, Database Management System, Internet Technologies, trends in Network computing, Messaging and Collaboration. SMAC (Social, Mobility, Analytics and Cloud)

**UNIT – II ORGANIZATIONAL APPLICATIONS**

Functional Information Systems, Decision Support Systems, Expert Systems, Knowledge Management System, Enterprise systems, RFID.

**UNIT – III SYSTEMS ANALYSIS & DESIGN**

Developing IS and System Development life Cycle, Structuring system process requirements, Structuring system logic requirements, Structuring system data requirements, Normalization in databases.

**UNIT – IV BUSINESS INTELLIGENCE**

Data Warehousing, Business Intelligence Framework, Business Analytics, OLAP, Data Mining, Business Performance Management, Dashboards, Balance scorecards.

**UNIT – V ECONOMICS OF IT AND MANAGING IT SECURITY**

Evaluating IT investments- Methods, Benefits, Costs & Issues, IT Economic strategies, Securing the enterprise, IS vulnerabilities and threats, Network security, Implementing security- Auditing and Risk Management.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary Developments Related to the Course during the Semester concerned. - Practical: Studying Management styles of two Indian institutions in the lime-light- Mini Project on information system in the firms in the Locale - role play, Group discussions.

### **TEXT BOOKS**

1. Management Information Systems, James A. O'Brien, George M. Marakas, Ramesh Behl, McGraw Hill Education, 2017.
2. Management Information Systems, Laudon & Laudon, Pearson publishing company, New Delhi, 2015
3. Management information Systems, O'Brien LA, 4th Edition, Tata McGraw Hill, New Delhi, 2015.
4. Management Information System, Noviarini, D., Deepublish, 2020.
5. Management Information Systems, Sixteenth Edition, Pearson, Jane P. Laudon Kenneth, C. Laudon, Pearson Education, 2019

### **REFERENCE BOOKS**

1. Management Information System, Laudon, Pearson, 2016.
2. Modern Systems Analysis & Design, 5th Edition, Hoffer, George & Valacich, Pearson Education, 2008
3. Information Technology for Management – Transforming organizations in the digital Economy, 6th edition, Effraim Turban, Dorothy Leidner, Ephraim Mclean, James Wetherbe, Wiley India publication, 2009.
4. Managing Information Systems in Business, Government and Society, 2ed, Rahul De, Wiley, 2018.
5. Management Information System, Jayant Oke, Nirali Prakashan, 2013.

### **E-RESOURCES**

1. <https://alison.com/course/understanding-systems-analysis-revised>
2. <https://freevidelectures.com/course/3432/system-analysis-and-design>
3. <https://www.mindluster.com/certificate/919>
4. <https://study.com/academy/course/computer-science-302-system-analysis-design.html>
5. <https://www.coursera.org/courses?query=system%20design>

### **COURSE OUTCOMES**

On completion of this course, the students will be able to

- Relate the basic concepts and technologies used in the field of management information systems;
- Compare the processes of developing and implementing information systems.
- Outline the role of the ethical, social, and security issues of information systems.
- Translate the role of information systems in organizations, the strategic management processes with the implications for the management.
- Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization.

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**SEMESTER II:**

**CORE COURSE -VI**

**Management Information System(P22MBACC21)  
MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO 5</b>
P22MBACC21	3	3	3	3	2
P22MBACC21	2	1	2	3	3
P22MBACC21	3	2	2	3	2
P22MBACC21	2	3	3	3	3
P22MBACC21	3	3	3	2	2
<b>Optimal Point</b>	3	3	3	3	2



Signature of the Director

# PRODUCTION MANAGEMENT

**First Year**

**Code Course – VII**

**Code: P22MBACC22**

**Semester – II**

**Credit - 5**

## COURSE OBJECTIVES

- To develop an understanding of how the operations, have strategic importance and can provide a competitive advantage in the workplace.
- To understand the relationship between operations and other business functions.
- To understand techniques of location and facility planning, line balancing, job designing and capacity planning in production management.

## UNIT – I

Production function – an Introduction – Definitions and types of production systems. Strategic Management – corporate strategies, production strategies, World class manufacturing, demand forecasting for Operations.

## UNIT – II

Product Design – New product development, process planning and design, value analysis, capacity planning.

## UNIT – III

Plant location – factors influencing plant location, Plant layout- classification of layout with advantages, layout design procedures, Production planning and control – aggregate planning-nature, Strategies, methods, Master production Plan.

## UNIT – IV

Quality Control - Definition, need, Quality control techniques, control charts, acceptance sampling, six sigma, quality circles. TQM-scope, benefits. JIT.

## UNIT – V

Flexible Manufacturing Systems. Poka yoke-Characteristics, levels, classification, principles, device. Kaizen-Elements, classification, steps in implementing kaizen.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary Issues Related to the Enterprise Resource Planning - Practical: Studying Poka yoke, Kaizen - Mini Project on Emerging Trends on Production management - Group discussions.

## TEXT BOOKS

1. Production Management, Dr. R.C. Bhatia, Suresh Fauzdar, SBPD Publishing House, 2019.
2. Production and Operations Management, R. Panneerselvam, PHI learning, 2018
3. Production and Operations management with solution manual, Kanishka bedi, Oxford University press, 2015
4. Production and operations Management, Martin K. Staff, Cengage learning, 2017.
5. Production & operation & Management, V.K. Khurana, ANE books, 2016

## REFERENCE

1. World – class manufacturing – A strategic perspective, B.S. Sahay and others, Macmillan publishers India ltd., 2015
2. Production and operations management, SN. Chary, Tata mcgrawhill, 2018
3. Production and operations management, Everett.E. Adam, Indian Edition, PHI learning, 2016
4. Production and operations management, N.G. Nair, Tata mcgraw hill Co., 2015.
5. Production and operations management, R.B. Khanna, PHI learning private ltd., 2016.

## E-RESOURCES

1. <https://www.mygreatlearning.com/academy/learn-for-free/courses/product-management>
2. <https://alison.com/course/advanced-diploma-in-production-and-operation-management>
3. <https://www.classcentral.com/course/swayam-production-management-20266>
4. <https://www.edx.org/learn/product-management>
5. <https://www.oxfordhomestudy.com/courses/online-management-courses/operations-management-free-courses>

## COURSE OUTCOMES

On completion of this course, the students will be able to

- Identify the elements of operations management and various transformation processes to enhance productivity and competitiveness.
- Analyze and evaluate various facility alternatives and their capacity decisions, develop a balanced line of production & scheduling and sequencing techniques in operation environments
- Develop aggregate capacity plans and MPS in operation environments.
- Plan and implement suitable materials handling principles and practices in the operations.
- Plan and implement suitable quality control measures through Quality Circles to TQM.

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**SEMESTER II****CORE COURSE-VII****PRODUCTION MANAGEMENT(P22MBACC22)****MAPPING****CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO</b>					
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBACC22	3	3	3	3	2
P22MBACC22	2	3	2	3	3
P22MBACC22	1	3	2	2	2
P22MBACC22	3	3	3	2	2
P22MBACC22	3	3	3	2	2
<b>Optimal Point</b>	3	3	2	3	2



Signature of the Director

# MARKETING MANAGEMENT

**First Year**

**Code Course – VIII**

**Code: P22MBACC23**

**Semester – II**

**Credit - 5**

## COURSE OBJECTIVES

- To understand the concepts of marketing management
- To learn about marketing process for different types of products and services
- To allow you to apply marketing concepts and theories to realistic marketing situations

### UNIT – I

Marketing – Concept – Functions – Marketing Planning & Implementing Marketing Programmes – Marketing Environment -Market Segmentation and Consumer Behaviour – Marketing Research and Market Information System.

### UNIT – II

Product: Meaning – Product Planning – Policies – Positioning – New Product Development – Product Life Cycle – Branding, Packaging, Labeling. Price: Pricing Objectives – Factors, Methods and Procedure.

### UNIT – III

Promotion: Promotion Mix – Advertisement –kinds of advertisement- Message – Copy – Advertisement Budgeting – Measuring Advertisement Effectiveness – Media Strategy – Sales Promotion – Personal Selling and Publicity.

### UNIT – IV

Physical Distribution: Distribution Mix – Managing Channel – Intermediaries – Transport and Warehousing – Distribution Strategies – Distribution Cost Analysis.

### UNIT – V

Marketing Strategies – Tools for Competitive Differentiation of Product – Strategies for Competitors – Leaders, challenges, follower & niches – Marketing of Services – Consumerism and Consumer Protections, Evaluating & Controlling Marketing Performance. Direct Selling, Direct Marketing.

### UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary Developments Related to the Course during the Semester concerned. - Studying Management styles of two Indian institutions - Mini Project on Marketing management concepts of the firms in the Locale - role play, Group discussions.



## **TEXT BOOKS**

1. Marketing Management (Fifteenth edition), Philip Kotler and Keven Lane Keller, Pearson Education, 2017.
2. Marketing Management by CzinkotaKotabe, India Edition, cengage learning, 2017.
3. Strategic marketing Management Text and cases, S.L. Gupta, Atlantic publishers (P) Ltd., 2015.
4. Marketing Management, VS Ramasamy and S. Namakumari, Macmillan publisher India ltd., 2016
5. Market based Management by Roger J. Best, Indian Edition, PHI learning India PVT Ltd., 2018.

## **REFERENCES**

1. Introduction to marketing, Adrian Palmer, Oxford University Press, 2016.
2. Marketing Management, Joel.R Evans & Barry Berman, India Edition Cengage Learning, 2016.
3. Strategic marketing management text and cases, UCP Mathur, Macmillan India Ltd., 2015
4. Strategic marketing, India Edition Ferrell & Hartline, cengage learning, 2018.
5. Marketing management, M. Govindarajan, PHI learning India PVT Ltd., 2019.

## **E-RESOURCES**

1. <https://alison.com/course/international-marketing-and-supply-chain-management>
2. <https://www.classcentral.com/course/swayam-international-marketing-58474>
3. <https://uniathena.com/short-courses/diploma-in-international-marketing-management>
4. <https://www.edx.org/learn/marketing-management>
5. <https://www.oxfordhomestudy.com/courses/marketing-online-courses/free-online-marketing-courses>

## **COURSE OUTCOMES**

On completion of this course, the students will be able to

- Identify the scope and significance of Marketing In Domain Industry
- Examine marketing concepts and phenomenon to current business events in the Industry.
- Coordinate the various marketing environment variables and interpret them for designing marketing strategy for business firms
- Illustrate market research skills for designing innovative marketing strategies for business firms
- Practice marketing communication skills relevant to the corporate world.

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SEMESTER II

CORE COURSE -VIII

**MARKETING MANAGEMENT (P22MBACC23)**  
**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBACC23	3	3	3	3	2
P22MBACC23	2	3	2	3	3
P22MBACC23	3	3	2	3	2
P22MBACC23	2	2	3	3	3
P22MBACC23	3	2	3	2	2
<b>Optimal Point</b>	3	3	3	3	2



Signature of the Director

# FINANCIAL MANAGEMENT

**First Year**  
**Code Course – IX**  
**Code: P22MBACC24**

**Semester – II**  
**Credit - 5**

## COURSE OBJECTIVES

- Provide an in-depth view of the process in financial management of the firm
- Develop knowledge on the allocation, management and funding of financial resources.
- Improving students' understanding of the time value of money concept and the role of a financial manager in the current competitive business scenario.

## UNIT – I

Financial Management- meaning, scope, objectives and functions. Financial Analysis and Control; Overview of Indian Financial System- Legal, Regulatory and tax framework.

## UNIT – II

Time value of Money; Instruments of Long Term Finance, Cost of Different Sources of Raising Capital. Cost of Capital - Computation for each source of finance and weighted **Optimal Point** cost of capital - EBIT -EPS Analysis - Operating Leverage - Financial Leverage - problems

## UNIT – III

Investment and Capital Structure Decisions - Net Income Approach - Net Operating Income Approach - MM Approach; Valuation and Rates of Return; Method of Capital Budgeting.

## UNIT – IV

Working Capital Management - Definition and Objectives - Working Capital Policies - Factors affecting Working Capital requirements - Forecasting Working Capital requirements(problems) - Cash Management - Receivables Management and - Inventory Management - Working Capital Financing - Sources of Working Capital and Implications of various Committee Reports.

## UNIT – V

Internal Financing and Dividend Policy - Types of Dividend Policy - Dividend Policy and share valuation - CAPM. Financial Modeling.

## UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary issues Related to the Financial Management - Practical analysis of Financial Management Terminologies - Mini Project on Financial Management concept of the Firms - Case Study on Financial Concepts.

## **TEXT BOOK**

1. Financial Management, I.M. Pandey, Vikas Publishing House PVT Ltd., 2021.
2. Financial Management Theory and practice, Prasanna chandra Tata Mcgraw Hill co., 2019.
3. Financial Management, Rajiv Srivstava& Anil Misra, Oxford University Press, 2017
4. Financial management, Preeti singh, Ane books PVT Ltd., 2017
5. Financial Management, D. Chandra Bose, PHI learning India PVT Ltd., 2018

## **REFERENCES**

1. Financial Management Text and cases, Brigham & Ehrhardt, India edition, cengage learning, 2016
2. Financial Management Text, problem and cases, My.Khan and PK. Jain, Tata Mcgraw Hill Co. 2015.
3. Financial Management, Bhabatosh Banerjee, PHI Learning PVT Ltd., 2018.
4. Financial Management India Edition, James C.VAN Horne & Joh. M.Wachowfcz, PHI learning Private Ltd., 2019
5. Financial Management, P. Periasamy, Tata Mcgraw Hill Co., 2017.

## **E-RESOURCES**

1. <https://www.mooc-list.com/course/finance-non-financial-managers-coursera>
2. <https://nptel.ac.in/courses/110105057>
3. [https://onlinecourses.nptel.ac.in/noc20\\_mg31/preview](https://onlinecourses.nptel.ac.in/noc20_mg31/preview)
4. [https://onlinecourses.swayam2.ac.in/cec20\\_mg05/preview](https://onlinecourses.swayam2.ac.in/cec20_mg05/preview)
5. <https://www.classcentral.com/course/swayam-financial-management-17605>

## **COURSE OUTCOMES**

On completion of this course, the students will be able to

- Describe the financial environment within which organisations must operate
- Critically evaluate the financial objectives of various types of organisations and the respective requirements of stakeholders
- Discuss the function of capital markets
- Explain alternative sources of finance and investment opportunities and their suitability in particular circumstances
- Assess the factors affecting investment decisions and opportunities presented to an Organisation

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SEMESTERII

CORE COURSE -IX

FINANCIALMANAGEMENT (P22MBACC24)

MAPPING

CO -PO-PSO matrices of course

K1:Low K2: Moderate K3: Substantial

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
P22MBACC24	3	3	3	2	3
P22MBACC24	3	2	3	2	3
P22MBACC24	3	2	2	3	2
P22MBACC24	2	2	3	3	2
P22MBACC24	2	3	2	2	2
<b>Optimal Point</b>	3	2	3	2	2



Signature of the Director

# HUMAN RESOURCE MANAGEMENT

**First Year**

**Code Course – X**

**Code: P22MBACC25**

**Semester – II**

**Credit - 5**

## **COURSE OBJECTIVES**

- To enable the students to understand the HR Management, at various levels in general and in certain specific industries or organizations.
- To help the students focus on and analyse the issues and strategies required to select and develop manpower resources
- To develop relevant skills necessary for application in HR related issues

## **UNIT – I PERSPECTIVES IN HUMAN RESOURCE MANAGEMENT**

Evolution of Human Resource Management – The Importance of the Human Factor – Objectives of Human Resource Management – Role of Human Resource Manager – Human Resource Policies – Understanding business process in the context of Human Resource Management – Computer Applications in Human Resource Management.

## **UNIT – II THE CONCEPT OF BEST-FIT EMPLOYEE**

Importance of Human Resource Planning – Forecasting Human Resource requirements – Internal and External sources. Selection Process – Screening – Tests – Validation – Interview – Medical Examination – Recruitment. Induction – Importance – Practices Socialization benefits.

## **UNIT – III TRAINING AND EXECUTIVE DEVELOPMENT**

Types of training methods – Purpose – Benefits – Resistance. Executive development programmes – Common practices – Benefits – Self Development.

## **UNIT – IV SUSTAINING EMPLOYEE INTEREST**

Compensation Plans – Rewards – Motivation – Theories of motivation – career Management – Developing Mentor – Portage Relationships.

## **UNIT – V PERFORMANCE EVALUATION AND CONTROL PROCESS**

Methods of Performance Evaluation – Feedback – Industry practices, Promotion, Demotion, Transfer and Separation – Implications of job change. The control process – Importance – Methods – Requirements of Effective Control System. Grievances – causes – Implications – Redressed Methods – Gender Sensitivity.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary Developments Related to the Course during the Semester concerned. - Practical: Studying Management styles of two Indian institutions - Mini Project on Human resource management in the firms in the Locale - role play, Group discussions.

### **TEXT BOOK**

1. Introduction to Human Resource Management, Mahrukh Mirza, Zaibun Nisa, Lambert academic publishing, 2019.
2. Human Resource Management, K. Aswathappa ,TataMcgraw Hill Co., 2018.
3. Human Resource Management, Mirza S Saiyadain, Tata Mcgraw Hill Co., 2018.
4. Human Resource Management, Chitra Atmavam Naik, ANE books PVT Ltd., 2020.
5. Human Resource Management, P. Jothi and D.N. Venkatesh, Oxford University Press, 2016.

### **REFERENCES**

1. Human Resource Management, Biswajeet Pattanayak, PHI learning India PVT Ltd., 2016.
2. Human Resource Management, SK. Sharma, Global India Publications PVT Ltd., 2019.
3. Introduction to Human Resource management, Paul Banfield and Rebecca kay, Oxford University press, 2017.
4. Managing Human Resource, Fisher, Schoenfeldt and shaw, cengage learning, 2015.
5. Managing Human Resources by Wayne. F Cascio, Tata Mcgraw Hill Co, 2017.

### **E-RESOURCES**

1. <https://www.classcentral.com/course/introduction-to-international-human-resources-man-20381>
2. <https://alison.com/course/international-and-strategic-human-resource-management-revised>
3. <https://www.freestudy.com/best-free-online-courses-in-human-resources/>
4. <https://www.reed.co.uk/courses/free/hr/online>
5. <https://www.oxfordhomestudy.com/courses/hr-courses-online/free-online-hr-courses-with-certificates>

### **COURSE OUTCOMES**

On completion of this course, the students will be able

- Develop the understanding of the concept of human resource management and to understand its relevance in organizations.
- Develop necessary skill set for application of various HR issues.
- Analyse the strategies required to select and develop manpower resources.
- Integrate the knowledge of HR concepts to take correct business decisions
- Able to identify and appreciate the significance of the ethical issues in HR

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**SEMESTERII:**

**CORE COURSE -X**

**HUMAN RESOURCE MANAGEMENT(P22MBACC25)**

**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBACC2 5	3	3	3	2	3
P22MBACC2 5	3	2	2	3	3
P22MBACC2 5	2	2	2	3	2
P22MBACC2 5	2	3	2	2	3
P22MBACC2 5	3	3	3	2	2
<b>Optimal Point</b>	3	3	2	2	3

*Signature of the Director*

Signature of the Director



## **BUSINESS LAW AND LABOUR LEGISLATION**

**First Year**

**CodeChoice Course – II**

**Code: P22MBAE2B**

**Semester – II**

**Credit - 4**

### **COURSE OBJECTIVES**

- To know the development and the judicial setup of Labour Laws.
- To learn the salient features of welfare and wage legislations.
- To learn the laws relating to Industrial Relations, Social Security and Working conditions.

### **UNIT – I**

The Indian Contract Act, 1872 - Introduction – Definition of contract – agreement – offer – acceptance – consideration capacity to contract – contingent contract – Quasi contract – performance – Discharge – Remedies to breach of contract.

### **UNIT – II**

Partnership- essentials of partnership, Rights and duties of partner, types of partners. Dissolution of partnership - Sale of Goods Act: Sale and Agreement to sell, Conditions and Warrantees, Transfer of property, Finder of goods, Performance of contract of sale, Rights of an unpaid seller.

### **UNIT – III**

Contract of Agency- Essentials of Contract of Agency – Creation of Agency – Kinds of Agents – Comparison Between an Agent and Servant – Comparison Between an Agent and Independent Contractor – Relationship of Principal and Agent – Duties of an Agent – Rights of an Agent – Duties and Rights of the Principal – Delegation of authority by an Agent – Sub Agent – Position of Principal and Agent in relation to third Parties – Termination of Agency.

### **UNIT – IV**

Company – Formation – Memorandum – Articles – Prospective Shares – debentures – Directors – appointment – Powers and duties. Meetings – Proceedings – Management – Accounts – audit – oppression & mismanagement – winding up.

### **UNIT – V**

The Consumer Protection Act, 1986; Object – Rights of Consumers –Important Terms- Consumer Complaint - Consumer Protection Councils – Redressal Machinery – District Forum – State Commission - National Commission. Cyber Law -Need for Cyber laws – Cyber law in India – Information Technology Act – 2000 – Defining Cyber Crime – Types of Cyber Crimes – Preventing of Computer Crime.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary Developments Related to the Legal Aspects of Business - Studying on Sale of Goods Act, Company Law – Group Discussion

### **TEXT BOOKS**

1. Business Law, Third Edition, Tejpal Sheth, Pearson Education, 2017.
2. Business Law, M.C. Kuchhal, Vivek Kuchhal, S Chand, 2018.
3. Taxmann's Business Laws, Dr. V.K. Jain, CA Shashank S. Sharma, Taxmann, 2022.
4. Legal Aspects of Business, Rashmi Aggarwal, Rajinder kaur, Pearson Education, 2020.
5. Legal aspects of Business, Ravinder kumar, Cengage learning, 2016.

### **REFERENCES**

1. Business law, D. Chandra Bose, PHI learning PVT Ltd., 2015.
2. Legal aspects of Business by Akhileshwar Pathak. Tata Mcgraw Hill, 2017.
3. Law of Business contracts in India, Sairam Bhat, Sage, 2015.
4. Company law, Ashok K Bagrial Vikas publishing House, 2016.
5. Business Law for Managers, P. K. Goel, Biztantatara Publishers, India, 2018.

### **E-RESOURCES**

1. <https://www.classcentral.com/course/swayam-fundamentals-of-legal-aspects-of-business-22987>
2. <https://edynamiclearning.com/course/business-law-1b-legal-aspects-of-business/>
3. <https://www.coursera.org/courses?query=business%20law>
4. <https://www.edx.org/learn/business-law>
5. <http://ycmou.digitaluniversity.ac/WebFiles/MBA401%20Business%20Laws12Apr2017.pdf> – Cengage Learning, 2nd Edition-2011.

### **COURSE OUTCOMES**

On completion of this course, the students will be able to

- Describe fundamental concepts of industrial relations.
- Understand the nature and role of trade unions for workers and industries.
- Study the relevance of collective bargaining and its impact on employee-management relations.
- Understand industrial disputes and ways to resolve them.
- Apply various industrial legislations in business.

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**SEMESTER II**

**CORE CHOICE COURSE-II**

**2.BUSINESS LAW AND LABOUR LEGISLATIONS (P22MBAE2B)**

**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO</b>					
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBAE2B	3	3	3	3	2
P22MBAE2B	2	3	2	3	3
P22MBAE2B	3	3	2	2	2
P22MBAE2B	2	3	3	2	3
P22MBAE2B	3	3	3	3	2
<b>Optimal Point</b>	3	3	3	3	2



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# PRINCIPLES OF MANAGEMENT

**First Year**  
**Non-Major Elective Course -I**  
**Code: P22MBANME1**

**Semester – II**  
**Credit - 4**

## **COURSE OBJECTIVES**

- To enable the students to study the evolution of Management,
- To study the functions and principles of management.
- To learn the application of the principles in an organization.
- 

## **UNIT – I INTRODUCTION**

Concept of Management –Features, Objectives, Functions and Importance of Management- Nature of Management-Management Principles- Role of Managers- Functional Areas of Management, Managerial Skills- Theory of Peter F. Drucker -Relevant Case studies.

## **UNIT – II PLANNING**

Meaning- Features of Planning- Importance of Planning- Objectives of Planning- Limitations of Planning- Barriers to Planning- Process of Planning- Principles of Planning- Features of Good Plan- Planning Premises- Process of Planning Premises- Types of Planning Premises - Relevant Case studies.

## **UNIT – III ORGANISING**

Meaning, Nature of Organisation- Process of Organising- Importance- Organisation Chart- Principles of Organisation Chart- Advantages of Organisation Chart- Limitations of Organisations Chart-Kinds of Organisation Chart. Formal Organisation - Features and Benefits of Formal Organisation- Limitations of Organisation Chart - Relevant Case studies.

## **UNIT – IV STAFFING**

Meaning- Nature of Staffing- Need for Staffing- Need for Staffing- Importance of Staffing- Staffing Process. Motivation: Meaning- Nature of Motivation- Importance of Motivation- Effective Motivation- Theories of Motivation. Controlling: Meaning- Nature - Importance - Types - Cybernetic and Non Cybernetic Control- Resistance to Control- Effects of Resistance to Control- Ways to overcome Resistance to Control- Control Process - Relevant Case studies.

## **UNIT – V SOCIAL RESPONSIBILITIES OF BUSINESS**

Meaning – nature – levels – Historical perspectives of Social responsibility – Barriers – Profit maximisation and Social responsibility – Various stake holders and social responsibility – Davis Model of Social responsibility – Phases – Approaches – Social responsibility in India – Social responsiveness and Social Audit – Ethics – Values - Relevant Case studies

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary issues Related to the Principles of management - Practical: Studying Management styles of two Indian institutions in the lime-light- Mini Project on management concept of the firms in the Locale - role play, Group discussions.

## **TEXT BOOKS**

1. Principle of Management, Mr. Kamlesh Jha, 2020
2. Principles and Practice of Management, Prasad L M, S Chand, 2019
3. Principles of Management Essentials You Always Wanted To Know, Callie Daum, Vibrant Publishers, 2020.
4. Tripathi P C & P N Reddy, Principles of Management, Mc Graw Hill India, 6th edition, 2017.
5. Procurement and Principles Management, Peter Baily, Barry Crocker, Pearson Education, 2018

## **REFERENCES**

1. Principles of Management, G. Murugesan, Laxmi Publications, 2017
2. Principles of Management, Neeru Vasishth, Taxmanns, 2015.
3. Principles of Management, Charles W.L Hill and Steven L McShane, McGraw Hill Education, Special Indian Edition, 2017.
4. Essentials of Management, Andrew J. Dubrin, Thomson Southwestern, 9th edition, 2016.
5. Modern management: concepts and skills, Samuel C. Certo and Tervis Certo, Pearson education, 12th edition, 2018.

## **E-RESOURCES**

1. <https://www.classcentral.com/course/independent-principles-of-management-11932>
2. <https://www.coursera.org/learn/principles-of-management>
3. <https://www.mygreatlearning.com/academy/learn-for-free/courses/principles-of-management>
4. [https://onlinecourses.nptel.ac.in/noc21\\_mg30/preview](https://onlinecourses.nptel.ac.in/noc21_mg30/preview)
5. <https://www.udemy.com/course/principles-of-management-j/>

## **COURSE OUTCOMES**

On completion of this course, the students will be able to

- Upon completion of the course, students will be able to have clear understanding of managerial functions like planning.
- Assess global situation, including opportunities and threats that will impact management of an organization.
- Demonstrate the ability to direct, lead and communicate effectively
- Determine the most effective action to take in specific situations.
- Evaluate approaches to addressing issues of diversity.

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**SEMESTER II****PRINCIPLES OF MANAGEMENT  
MAPPING****CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO</b>					
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBANME1	3	3	3	3	2
P22MBANME1	2	2	2	3	3
P22MBANME1	3	3	2	3	2
P22MBANME1	2	2	3	3	3
P22MBANME1	3	2	3	2	2
<b>Optimal Point</b>	3	2	3	3	2



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**Compulsory  
Training**

**First Year  
Summer Internship Training  
Code: P22MBASIT**

**Semester – II  
Credit - 5**

The student has to undergo Summer Internship Training at the end of Semester-II for a period of not less than four weeks in any concern and should submit a report on various functional areas of the firm/industry which will be evaluated during Viva-Voce Examination. The Summer Internship Training Certificate will be issued by the concerned company. The proportion of marks for the Summer Internship report and the Viva-Voce is 50:50. The Summer Internship Report will be evaluated by the External Examiner Only.

**EXTERNAL EVALUATION – (50 MARKS)**

External examiner to be appointed by the University as followed for project. One examiner may be appointed for every 15 students.

Break up of marks is as follows:

1.	Summer Internship Report	- 50 Marks
2.	Viva Voce -	50 Marks
		-----
		100 Marks
		-----

- A candidate shall be declared to have passed in the **SUMMER INTERNSHIP TRAINING** if he/she secures not less than 40% in each of the Summer Internship report and Viva-voce but not less than 50% in the aggregate of both the marks for Summer Internship Report and Viva-voce.
- A candidate who secures less than 40% in the Summer Internship report must resubmit the Report. Such candidates need to defend the resubmitted Report at the Viva-voce within a month. A maximum of 2 chances will be given to the candidate.

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## **INTERNATIONAL BUSINESS ENVIRONMENT**

**Second Year**  
**Core Course-XIV**  
**Code: P22MBACC41**

**Semester – IV**  
**Credit - 5**

### **COURSE OBJECTIVES**

- Basic and broad knowledge in international business environment, strategies and management.
- Awareness of the different thinking and viewpoints of diverse cultures.
- Awareness of the global business environment and its impact on businesses.

#### **UNIT – I**

International Business: An overview – Modes of International Business; The External Environment - Economic, Political Environment, technological and Cultural Environment; Its Influence on Trade Investment Patterns; Recent World Trade and Foreign Investment Trends

#### **UNIT – II**

Foreign Direct Investment-FDI-Types of FDI, Rationale for FDI, Benefits of FDI to Home countries, Benefits of FDI to MNC's, Threats and Restrictions on MNCs, Adverse effect of FDI on Host countries. Reasons for India seeking FDI, Hurdles for FDI in India.

#### **UNIT – III**

World Financial Environment; Cross-national Cooperation and Agreements; Tariff and Non-Tariff Barriers, WTO, Regional Blocks. Cross Border Mergers& Acquisition-Reasons for mergers & Acquisition, why do M & A fail? -Stages involved in M & A-Regulations of M & As.

#### **UNIT – IV**

Foreign Exchange Market Mechanism: Determinants of Exchange Rates; Euro-currency Market; Offshore Financial Centers: International Banks; Non-Banking Financial Service Firms; Stock Markets.

#### **UNIT – V**

Global Competitiveness; Export Management; Licensing; Joint Ventures Technology and Global Competition; Globalisation and Human Resource Development; Globalisation with Social Responsibility; Negotiating an International Business, Issues in Asset Protection; Multilateral Settlements.

#### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary issues Related to International Business Environment - Studying World Financial Environment, Foreign Exchange Market Mechanism - Case study relevant to Recent Challenges - group discussion.



## **TEXT BOOKS**

- 1) International Business Environment, Sundaram K. Anant, Pearson, 2015.
- 2) Global Business Environment, Mansi Kapoor, Sage Publication, 2019.
- 3) The Global Business Environment: Meeting the Challenges (3rd edition), Morrison J, Palgrave Macmillan, 2022.
- 4) The International Business Environment (4th ed.), Hamilton, L., & Webster, P., Oxford University Press, 2019.
- 5) Introduction to Global Business: Understanding the International Environment & Global Business Functions (2nd ed.), Gaspar, J., Kolari, J., Hise, R., Bierman, L., & Smith, M. L., Cengage Learning, 2016.

## **REFERENCES**

- 1) Business Environment: Indian and Global Perspective, Faisal Ahmed, M Absar Alam, PHILearning Publication, 2017.
- 2) The International Business Environment and National Identity, Tatiana Gladkikh, Routledge, 2019.
- 3) The Global Business Environment: Towards Sustainability?, Janet Morrison, Red Globe Press, 2020.
- 4) Multicultural Behavior and Global Business Environments, Kamal Dean Parhizgar, Routledge Publications, 2015.
- 5) Global Information Society: Operating Information Systems in a Dynamic Global Business Environment, Yi-chen Lan, IGI Publishing, 2015.

## **E-RESOURCES**

1. International Business Environment <https://alison.com> › Business › Business Communication
2. [https://onlinecourses.swayam2.ac.in/cec20\\_mg12/preview](https://onlinecourses.swayam2.ac.in/cec20_mg12/preview)
3. <https://www.coursera.org/learn/global-business-environment>
4. <https://www.classcentral.com/course/global-business-environment-8063>
5. <https://www.futurelearn.com/courses/business-environment>

## **COURSE OUTCOMES**

On completion of this course, the students will be able to:

1. Understand the concepts of international business with respect to international scenarios.
2. Apply the current business phenomenon and to evaluate the global business environment in terms of economic, social and legal aspects
3. Analyse the principle of international business and strategies adopted by firms.
4. Integrate concepts of international business with functioning of global trade
5. Develop an entry strategy into other markets, recognizing the nature of institutions and forces governing the process of globalization.

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SEMESTERIV:

CORE COURSE -XIV

**INTERNATIONAL BUSINESS ENVIRONMENT (P22MBACC41)**

**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO</b>					
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBACC41	3	3	3	3	2
P22MBACC41	2	3	2	3	3
P22MBACC41	3	3	2	3	2
P22MBACC41	2	3	3	3	3
P22MBACC41	3	3	3	2	2
<b>Optimal Point</b>	3	3	3	3	2



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# ENTREPRENEURIAL DEVELOPMENT

**Second Year**  
**Core Course-XV**  
**Code: P22MBACC42**

**Semester – IV**  
**Credit - 5**

## COURSE OBJECTIVES

- To introduce various qualities required for entrepreneurship
- To explain various entrepreneurship models
- To organize interaction with successful entrepreneurs

### UNIT – I

Entrepreneur - meaning - importance - Qualities, nature, types, traits, culture. Similarities and differences between entrepreneur and Intrapreneur. Entrepreneurship and economic development - its importance - Role of entrepreneurship - entrepreneurial environment.

### UNIT – II

Evolution of entrepreneurs - entrepreneurial promotion: Training and development. mobility of entrepreneurs - entrepreneurial change - occupational mobility - factors in mobility - Role of consultancy organizations in promoting entrepreneurs - Forms of business for entrepreneurs.

### UNIT – III

Project management: Sources of business idea - Project classifications - identification - formulation and design - feasibility analysis. Financial analysis - project cost estimate - operating revenue estimate -Ratio analysis - investment Process - B E analysis - Profit analysis - Social cost benefit analysis - Project Appraisal methods. Preparation of Project Report and presentation.

### UNIT – IV

Project finance: Sources of finance - Institutional finance - Role of IFC, IDBI, ICICI, LIC, SFC, SIPCOT, Commercial Bank - Appraisal of bank for loans. Institutional aids for entrepreneurship development - Role of DICS, SIDCO, NSICS, IRCI, NIDC, SIDBI, SISI, SIPCOT, Entrepreneurial guidance bureau - Approaching Institutions for Assistance.

### UNIT – V

Steps in setting SSI unit - Problems of entrepreneurs - Sickness in small industries - reasons and remedies - Incentives and subsidies - Evaluating entrepreneurial performance - Rural entrepreneurship - Women entrepreneurship.

### UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary issues Related to Entrepreneurial Management - Studying Project Management, ProjectFinance- Case study relevant to problem of entrepreneurs - group discussion.

## TEXT BOOKS

- 1) Entrepreneurial Development, Np Srinivasan Cb Gupta, S Chand, 2020.
- 2) Entrepreneurship Development, S A Kumar, S C Poornima, M K Abraham, K Jayshree, new agepublishers, 2021.
- 3) Entrepreneurial Development, Khanka S.S., S Chand, 2015.
- 4) Entrepreneurial Development / Management Of Small Business, P M Meera Mohiadeen, Nahidha Publication, 2018.
- 5) Entrepreneurial Development, Vasant Desai, Himalaya Publishing House, 2016

## REFERENCES

- 1) Internationalization of Entrepreneurial Innovation in the Global Economy, Luisa Cagica Carvalho, Idea Group, 2015.
- 2) Entrepreneurial Success and its Impact on Regional Development, Luisa Carvalho, Information Science Reference, 2015.
- 3) The Dynamics of Entrepreneurial Development and Management, Vasant Desai, Himalaya Publishing House, 2016.
- 4) Entrepreneurship in the Fourth Sector: Entrepreneurial Ecosystems and Sustainable Business Models, Mara Isabel Snchez-herndez, Lusa Carvalho, Conceio Rego, Maria Raquel Lucas, Adriana Noronha, Springer, 2022.
- 5) Entrepreneurship, Robert D. Hisrich, Michael P. Peters, Dean A. Shepherd, Sabyasachi Sinha, McGraw Hill, 2020.

## E-RESOURCES

1. <https://www.esc.edu/degrees-programs/undergraduate-aos/business-management-economics/learning-resources/entrepreneurship-resources/>
2. <https://www.edx.org/learn/entrepreneurship>
3. [https://midassoe.com/pg-course-admission/entrepreneurship/?utm\\_source=google&utm\\_medium=entrepreneurship\\_cpc\\_entrepreneurship\\_course&gclid=CjwKCAjwzeqVBhAoEiwAOrEmzRZ6Cz5mG2XsIClz-tD1jr8zcT7vXay7cp0FvU618csSLztP024QihocRGYQAvD\\_BwE](https://midassoe.com/pg-course-admission/entrepreneurship/?utm_source=google&utm_medium=entrepreneurship_cpc_entrepreneurship_course&gclid=CjwKCAjwzeqVBhAoEiwAOrEmzRZ6Cz5mG2XsIClz-tD1jr8zcT7vXay7cp0FvU618csSLztP024QihocRGYQAvD_BwE)
4. <https://ied.eu/>
5. <https://www.niesbud.nic.in/entrepreneurship-development-programme.htm>

## COURSE OUTCOMES

On completion of this course, the students will be able to

- Understand theories of entrepreneurship and business development
- Be able to state, understand and evaluate the key factors needed to develop a successful business
- Understand the key resources required to develop an existing business, launch a new venture, or initiate a business enterprise
- Understand the central role of opportunity recognition and marketing to business development
- Understand the creation of business sustainability

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SEMESTERIV:

CORE COURSE -XV

**ENTREPRENEURIAL DEVELOPMENT (P22MBACC42)**

**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBACC42	3	3	3	3	2
P22MBACC42	2	3	2	3	3
P22MBACC42	3	3	2	3	2
P22MBACC42	2	3	3	3	3
P22MBACC42	3	3	3	2	2
<b>Optimal Point</b>	3	3	3	3	2



Signature of the Director

# MANAGERIAL SKILLS

**Second Year**  
**Core Course-XVI**  
**Code: P22MBACC43**

**Semester – IV**  
**Credit - 5**

## **COURSE OBJECTIVES**

- To examine the complexity of managing in a global world.
- To use management thought to develop a better understanding of motivation.
- To develop an ability to work with moral and ethical dilemmas and make decisions using critical thinking

## **UNIT – I THINKING STRATEGIES**

Strategic thinking – meaning – questions- things included in Strategic thinking – Process consideration in Strategic thinking – Strategic thinking competencies – importance of Strategic thinking – characteristics of Strategic Thinkers – Points to be kept in mind in Strategic thinking. Lateral Thinking – meaning – why Lateral Thinking – when to use Lateral Thinking – Benefits of Lateral Thinking – Techniques used in Lateral Thinking – Who needs Lateral Thinking – How to use Lateral Thinking? – Conventional Vs Lateral Leaders – Questions asked by Lateral Leaders – becoming a Lateral leader

## **UNIT – II INTERPERSONAL STRATEGIES**

Conflict Resolution – meaning – points to be understood before studying conflict resolution – sources of conflict – common reactions to conflict – role of perception in conflict – steps for Conflict Resolution – Conflict handling matrix – Functional and Dysfunctional outcome of conflict. Negotiation skills – process – styles – outcome – principles involved – negotiation model – being a negotiator – qualities of a negotiator

## **UNIT – III IMPLEMENTATION STRATEGIES**

Facing changes – meaning – characteristics – why changes – pace of changes – impact of resistance – Reasons for resistance – types of people in facing changes – introducing change. Facing challenges – meaning – importance – path to facing challenges – benefits of facing challenges.

## **UNIT – IV ACTION BASED STRATEGIES**

Risk taking - meaning – factors determining Risk Taking – Risk management – users of Risk Management – Steps in Risk Management. Effective decision making – meaning – approaches – methods – steps – Decision making at the work place.

## **UNIT – V BEHAVIOURAL STRATEGIES**

Motivation and Staying motivated – meaning – finding reason for being motivated – staying motivated at work place – staying motivated in negative work environment – staying motivated during crisis. Balancing work and life – meaning – work satisfaction – gender differences – responsibility of the employers and employees – ways of balancing work and life – handling professional and personal demands – organizing your desk.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only) :**

Contemporary issues Related to Managerial Skills – Studying Thinking Strategies, Interpersonal Strategies - Group discussion on work life balance.

## **TEXT BOOK**

1. Soft Skills – Know Yourself & Know the World, Alex K., S.Chand & Company LTD, 2012.
2. Basic Managerial Skills for All, Mcgrath E.H, Prentice Hall India Learning Private Limited, 2011.
3. Managerial Skills Book, P M Meera Mohiadeen, Nahidha Publication, 2018.
4. Managerial Communication & Soft-skills, Bandi S. Herold, Walnut Publication, 2018.
5. Manager Skills: Complete Step-by-Step Guide on How to Become an Effective Manager, Garrett Redfield, 2020.

## **REFERENCES**

1. A Book on Development of Soft Skills, (Soft Skills: A Road Map to Success), Meena.KandV.Ayothi, P.R. Publishers & Distributors, 2013.
2. Changing Employee Behavior: A Practical Guide for Managers, Nik Kinley, Shlomo Ben-Hur, Palgrave Macmillan, 2015.
3. The Power of A Positive Attitude: Your Road To Success, Roger Fritz, Arthur R. Pell, Fingerprint Publishing, 2019
4. How to Be a Good Leader: The Ultimate Guide to Developing the Managerial Skills, Teamwork Skills, and Good Communication Skills of an Effective Leader, Terry Cochran, 2015.
5. The Managers Book of Checklists: A Practical Guide to Improve Your Managerial Skills, Derek Rowntree, Prentice Hall, 1996.

## **COURSE OUTCOMES**

On completion of this course, the students will be able to

- Develop the ability to apply the theoretical and practical aspects of management / marketing / projects to formulate strategies.
- Evaluate emerging business model and its complexities, manage change, and optimize business performance in a dynamic environment.
- Employ critical-thinking and analytical skills to investigate complex business problems to propose viable solutions.
- Exhibit the ability to make reasoned, ethical decisions that are based on professional standards for ethical conduct in the best interest of the project, the organization, the environment, and society as a whole.
- Assess leadership styles from the perspectives of the role of the leader and leadership effectiveness in organizations that are managed by function, by matrix, and by projects.

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## MANAGERIAL SKILLS (P22MBACC43)

## MAPPING

CO -PO-PSO matrices of course

K1:Low K2: Moderate K3: Substantial

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
P22MBACC43	3	3	3	3	2
P22MBACC43	2	3	2	3	3
P22MBACC43	3	-	2	3	-
P22MBACC43	2	3	2	3	3
P22MBACC43	3	3	3	3	-
<b>Optimal Point</b>	3	3	2	3	3



Signature of the Director



# STOCK MARKET PRACTICES

**Second Year**  
**Value Added Course—II**  
**Code: P22MBAVAC2**

**Semester – IV**  
**Credit –2\***

## COURSE OBJECTIVES

- To give an overview of Capital Market.
- To enable the students to understand various innovative Financial Instruments.
- To impart knowledge regarding the calculation methodology of Stock Market Indices.

### UNIT – I

Capital Markets in India - An overview of Indian Securities Market, Functions, Intermediaries, Role of Primary Market – Methods of floatation of capital – Problems of New Issues Market – IPO's – Investor protection in primary market – Recent trends in primary market – SEBI measures for primary market.

### UNIT – II

Stock exchanges and its Functions - Functions of Secondary Market – Organisation and Regulatory framework for stock exchanges in India – SEBI: functions and measures for secondary market – Overview of major stock exchanges in India - Listing of Securities: Meaning – Merits and Demerits – Listing requirements, procedure, fee – Listing of rights issue, bonus issue, further issue – Listing conditions of BSE and NSE – Delisting

### UNIT – III

Trading, settlement and Surveillance System In Stock Exchanges : Different trading systems – BSE - BOLT System – Different types of settlements - Pay-in and Pay-out – Bad Delivery – Short delivery – Auction – NSE – NEAT system options – Market types, Order types and books – De-mat settlement – Physical settlement – Institutional segment – Funds settlement – Valuation debit – Valuation price – Bad and short delivery Risk management system in BSE & NSE – Margins – Exposure limits – Surveillance system in BSE & NSE – Circuit breakers

### UNIT – IV

Stock Market Indices: Meaning, Purpose, and Construction in developing index – Methods (Weighted Aggregate Value method, Weighted **Optimal Point** of Price Relatives method, Free- Float method) – Stockmarket indices in India – BSE Sensex - Scrip selection criteria – their BSE indices (briefly) – NSE indices – S&P CNX Nifty – Scrip selection criteria – Construction – Stock market indices in foreign countries (Overview).

### UNIT – V

Commodity and Currency Markets: Commodity exchanges: evolution and history – role in globalizing economy – governing regulations – price –risk management – commodity exposure – hedge accounting – currency futures – managing exchange rate – carbon markets – weather derivatives – ETFs – Purpose, Importance, types, construction.

### UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)

Contemporary Developments Related to Stock Market – Studying Different trading systems and stockmarket indices – Mini project on IPOs - Group Discussion.

## TEXT BOOKS

1. Investment and Securities Market in India, V. A. Avadhani, Himalaya Publishing House, 2017.
2. Security Analysis and Portfolio Management, Ranganatham, Pearson Education, 2015.
3. Stock Market in India, Daniel Lazar, Venkatesan P, 2015.
4. Punithavathy Pandian, “Security Analysis and Portfolio Management”, Vikas Publishing House Pvt. Ltd, 2016.
5. Prasanna Chandra, “Investment Analysis and Portfolio management”, Tata McGraw Hill, 3rdEdn., 2014.

## REFERENCES

1. Sanjeev Agarwal, A Guide to Indian Capital Market, Bharat Publishers, 2015.
2. Ravi Puliani and Mahesh Puliani, Manual of SEBI, Bharat Publication, 2017.
3. Dr.Sharma. F. C, Security Analysis and Portfolio Management, SBPD Publications, 2020.
4. Abhishek Mishra, Dr. Subramanian Swamy, Indian Capital Market, Lex Lab Publication, 2016.
5. Gourishankar S.Hiremath, Indian Stock Market: An Empirical Analysis of Informational Efficiency, Springer, 2016.

## E-RESOURCES

1. [https://onlinecourses.swayam2.ac.in/imb19\\_mg09/preview](https://onlinecourses.swayam2.ac.in/imb19_mg09/preview)
2. <https://www.nseindia.com/resources/publications-market-reports>
3. [https://www.bseindia.com/static/about/BSE\\_Ebooks.aspx](https://www.bseindia.com/static/about/BSE_Ebooks.aspx)
4. <https://www.sebi.gov.in/>
5. [https://play.google.com/store/apps/details?id=com.alifesoftware.stocktrainer&hl=en\\_IN&gl=](https://play.google.com/store/apps/details?id=com.alifesoftware.stocktrainer&hl=en_IN&gl=)

## COURSE OUTCOMES

On completion of this course, the students will be able to:

- Familiarization with Capital Market and Depository System prevalent in capital markets.
- Clarity about the current status of Stock Exchanges in India.
- Understanding about the Trading, Clearing and Settlement procedures.
- Familiarize the students regarding the techniques of analyzing securities being applied by fundmanagers.
- Develop an insight into various issues in portfolio construction, revision and evaluation.

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**STOCK MARKET PRACTICES(P22MBAVAC2)****MAPPING****CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBAVAC2	3	3	3	3	2
P22MBAVAC2	2	3	2	3	3
P22MBAVAC2	3	3	2	3	2
P22MBAVAC2	2	3	3	3	3
P22MBAVAC2	3	3	3	2	2
<b>Optimal Point</b>	3	3	3	3	2


**Signature of the director**

# MARKETING COMMUNICATION AND MEDIA MANAGEMENT

**Second Year**

**Elective Course A: Marketing**

**Code: P22MBA4EM1**

**Semester – IV**

**Credit –4**

## **COURSE OBJECTIVES**

- Familiarize the concepts of advertising as a form of communication
- To gain knowledge on the basics of designing and execution of advertisements
- Learn to select suitable media and design media planning

## **UNIT – I INTRODUCTION**

Integrated Marketing Communication and its role - Advertisement - Concept and Definition  
- Advertisement objectives - Advertising Agency: Types - selection and remuneration - Client - Agency Relationship- The changing marketing communication environment- Marketing and New technology-New Trends in Marketing communication

## **UNIT – II DESIGN AND EXECUTION OF ADVERTISEMENTS**

Advertisement brief - creative process - Message development - Different types of advertisements - Layout - Design - Appeal - Copy structure - BTL and ATL - Advertisement media: types

## **UNIT – III MEDIA PLANNING AND SELECTION**

Introduction to different media- comparison of their advantages and disadvantages; Media planning-functions – process- Media planning for Consumer and Industrial goods; Media selection-buying TV space / Airtime / radio slot; buying magazines space/ Newspaper space.

## **UNIT – IV MEDIA MANAGEMENT**

Selection of media vehicles based on Reach, Frequency, Cost efficiency, Circulation, Pass- along rate (Print); Media Timing – Flight, pulsing, Media scheduling, comparing- and evaluation of continuity of media options; Deciding on the most suitable media – mix- buying and negotiating the most appropriate media.

## **UNIT – V SALES PROMOTION**

Sales promotion: objectives, scope - Sales promotion categories: consumer- oriented, channel- oriented, company-oriented - Designing the sales promotion techniques - Integrated promotion - Measuring the effectiveness of sales promotion - Methods of on-line sales promotion.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary Developments Related to Integrated Marketing Communication – Practical: Studying Media planning for Consumer and Industrial goods – Mini project on Designing of sales promotion techniques – Group discussion.

## TEXT BOOKS

1. S.A. Chunawala, “Advertisement & Promotion Management”, Himalaya Publishing, 2017.
2. Kenneth Clow and Donald Baack, “Integrated Advertisements, Promotion and Marketingcommunication”, Prentice Hall of India, New Delhi, 2016.
3. JaishriJethwaney and ShrutiJain, Advertising Management, Oxford University Press,New Delhi,2018.
4. S.H.H. Kazmi and Satish K. Batra, “Advertising & Sales Promotion”, Excel Books, New Delhi,2019.
5. Kitchen, P. J., &Tourky, M. E. (2022). Integrated Marketing Communications: A Global Brand-Driven Approach (2nd ed. 2022 ed.). Palgrave Macmillan.

## REFERENCES

1. George E. Belch and Michel A. Belch, “Advertising & Promotion”, McGraw Hill, Singapore,2014.
2. Chaturvedi B.K., “Media Management”, Global Vision Pub House, 2019’
3. Ken Black, Applied Business Statistics, 7th Edition, Wiley India Edition, 2012.
4. C.L.Tyagi and Arun kumar,“ Advertising management”, Atlantic publishers and distributors,New Delhi,2014.
5. Iacobucci, D. (2021). Marketing Management (MindTap Course List) (6th ed.). CengageLearning.

## E-RESOURCES

1. <https://www.coursera.org/learn/social-media-management>
2. <https://www.udemy.com/topic/social-media-marketing/free/>
3. <https://www.edx.org/learn/social-media-marketing>
4. <https://www.simplilearn.com/introduction-to-learn-social-media-free-course-skillup>
5. <https://learndigital.withgoogle.com/digitalgarage/courses>

## COURSE OUTCOMES

On completion of this course, the students will be able to:

- Apply the knowledge of advertising for promoting products
- Interact with the advertising agencies to design and execute suitable advertisements
- Select the right media and design media plans for effective implementation
- Manage all media related aspects and issues
- Recognize the different sales promotional tools applied in real time marketing situations.

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**SEMESTERIV:**

**ELECTIVE COURSE:MARKETING**


**MARKETING COMMUNICATION AND MEDIA MANAGEMENT  
(P22MBA4EM1)**

**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBA4EM1	3	3	3	3	2
P22MBA4EM1	2	2	2	3	3
P22MBA4EM1	3	3	2	3	2
P22MBA4EM1	2	2	3	3	3
P22MBA4EM1	3	3	3	2	2
<b>Optimal Point</b>	3	3	3	3	2

  
**Signature of the director**

## **IX-MARKETING OF SERVICES**

**Second Year**

**Elective Course A: Marketing**

**Code:P22MBA4EM4**

**Semester – IV**

**Credit –4**

### **COURSE OBJECTIVES**

- The course purposes to bring out the emerging service environment in India and the world.
- It emphasizes the distinctive aspects of service marketing.
- It aims at equipping students with concepts and techniques that help in taking decisions relating to various services marketing situations.

### **UNIT – I**

Marketing Services: Introduction - Growth of the service sector - The Concept of Service – Characteristics of Service – Classification of Service – Designing of the Service, Blueprinting, Using Technology, Developing Human Resources, Building Service Aspirations. Developing a Framework for understanding Services Marketing – Classification of Services on similar characteristics.

### **UNIT – II**

Nature of service – Relationship with customers – customerisation and judgement in Service delivery Nature of demand relative to supply method of service – Delivery – Significance of people based attribute and / or facility based attribute of the service product.

### **UNIT – III**

Managing Customer Mix – Deciding on what segment of Customers to serve – Positioning the service Developing of service positioning strategy – Positioning map.

### **UNIT – IV**

Managing Demand – Demand supply interaction – Strategies relating to demand – Inventory Demand Flexible capacities – Modifying marketing mix elements to manage demand.

### **UNIT – V**

Service business as a system – service operations subsystems – Service delivery subsystem – Servicemarketing subsystem – Planning, organization and implementation of Marketing effort – interfunctional Conflict between marketing and operation – Evaluation of marketing effort.

### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary Developments Related to Marketing of services – Practical: Studying strategies of positioning – Mini project on marketing mix – Group discussion.

## TEXT BOOKS

1. Services Marketing – operations and Management, By Vinnie Jauhari&Kirtidutta, Oxford University Press, 2017.
2. Marketing of services, India Edition, K. Douglas Hofiman, John.E.G. Bateson, Cengage learning,2016.
3. Services marketing by Kapoor, Paul &Halder, TATA Mcgraw Hill Co, Chennai, 2015.
4. Services marketing Govind Apte, Oxford University Press, 2017.
5. Services marketing, The Indian Context, R. Srinivasan, PHI learning, 2018.

## REFERENCES

1. Services marketing and management, Audrey Gilmore, Response Book, sage publication, 2014.
2. Services marketing text and cases, Steve Baron, Palgrave Macmillan, ANE book PVT Ltd., 2016.
3. Text book of marketing of services, Nimit chowdhary, Macmillan India Ltd., 2015.
4. The Marketing Mix: Master the 4 Ps of marketing, Carmela Milano, 50Minutes.com, 2015.
5. Advanced Positioning, Flow, and Sentiment Analysis in Commodity Markets, Mark J. S. Keenan, Wiley, 2019.

## E-RESOURCES

1. <https://www.edx.org/course/services-marketing-concepts-applications>
2. <https://alison.com/course/diploma-in-services-marketing-integrating-people-technology-and-strategy>
3. <https://www.classcentral.com/course/swayam-services-marketing-concepts-applications-23797>
4. <https://ecornell.cornell.edu/courses/hospitality-and-foodservice-management/services-marketing-planning-and-management/>
5. [https://onlinecourses.nptel.ac.in/noc20\\_mg12/preview](https://onlinecourses.nptel.ac.in/noc20_mg12/preview)

## COURSE OUTCOMES

On completion of this course, the students will be able to

- Understand the concept of services and intangible products
- Evaluate the relevance of the services industry to other industries
- Examine the characteristics of the services industry and its modus operandi
- Investigate the significance and impact of quality in service-oriented environments.
- Visualise future changes in the Services Industry

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**IX- MARKETING OF SERVICES (P22MBA4EM4)  
MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBA4EM4	3	3	3	3	2
P22MBA4EM4	2	3	2	3	3
P22MBA4EM4	3	3	2	2	2
P22MBA4EM4	2	3	3	2	3
P22MBA4EM4	3	3	3	2	2
<b>Optimal Point</b>	3	3	3	2	2



Signature of the director

## **X-RETAIL MANAGEMENT**

**Second Year**

**Elective Course A: Marketing**

**Code:P22MBA4EM5**

**Semester – IV**

**Credit –4**

### **COURSE OBJECTIVES**

- Build awareness of the retail industry, to foster career growth among people who work in retail
- Assess their own strengths and weaknesses to devise sustainable strategies to survive and grow in competitive markets
- Create and analyze retail metrics to monitor store performance and enhance retail staff productivity

### **UNIT – I**

Retailing – meaning, definitions, functions performed by retailers, Importance of retailing. Requisites for successful retailer. Forces affecting retail sector in India. The retail life cycle. The strategic Retail Planning process, Retailing mix. Issues in Retailing.

### **UNIT – II**

Traditional and modern formats of retail business – Marketing Concepts in Retailing – Consumer purchase behaviour – Cultural and Social group influence on Consumer Purchase Behaviour.

### **UNIT – III**

Retail Location strategies: Issue to be considered in site selection. Decisions on geographic locations of a retail store. Location site and types of Retail development. Types of planned shopping area. Factors involved in the location decision. Catchment area analysis.

### **UNIT – IV**

Merchandise Planning – Stock turns, Credit Management, Retail Pricing, Return on per. sq. feet of space – Retail Promotions . Traffic flow and analysis – Population and its mobility – Exteriors and layout – Customer traffic flows and pattern – Creative display. Supply Chain Management – Warehousing – Role of IT in supply chain management.

### **UNIT – V**

Consumerism and ethics in Retailing, Retail Audits, e-Retailing, Application of IT to Retailing, Retail Equity, Technology in Retailing – Retailing through the Internet.

### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary Developments Related to Retail Management – Practical: Traditional and modern formats of retail business – Mini project on e-Retailing – Group discussion.

## TEXT BOOKS

1. Retailing Management, Text and cases, SwapnaPradhan, Tata McGraw Hill Co, 2020.
2. Principles of retail management, Rosemary Varley and Mohamed Raffiq, Palgrave macmillan, ANE books PVT Ltd., 2018.
3. Retail management, Dunne Lusch, cengage learning, 2019.
4. Retail supply chain management, James B. Ayers and Mary Odegaard, ANE books PVT Ltd., 2015.
5. Retail Management, Chakradhar Publication, 2020.

## REFERENCES

1. Retailing management, Michael Barton and others, Tata McGraw Hill co, 2015.
2. Managing Retailing, Piyush Kumar Suiha, Oxford University press, 2018.
3. Retailing environment & operations, Andrew J. Newman and other, cengage learning, 2018.
4. International Retailing, Nicholas Alexander, Oxford University press, 2017.
5. Fundamentals of Retailing, KVS madaan, Tata McGraw Hill Co, 2019.

## E-RESOURCES

1. <https://alison.com/course/diploma-in-retail-management>
2. <https://www.mygreatlearning.com/academy/learn-for-free/courses/retail-management>
3. <https://www.classcentral.com/course/swayam-retail-management-14274>
4. <https://www.coursera.org/courses?query=retail>
5. <https://www.edx.org/learn/retail>

## COURSE OUTCOMES

On completion of this course, the students will be able to

- Clarify the concept and related terms in retail management.
- Comprehend the ways retailers use marketing tools and techniques to interact with their customers.
- Understand various formats of retail in the industry.
- Recognize and understand the operations-oriented policies, methods, and procedures used by successful retailers in today's global economy
- Learn how to deal with customers and understand their needs to sustain in the market.

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SEMESTERIV

ELECTIVE COURSE A:MARKETING

**X-RETAIL MANAGEMENT (P22MBA4EM5)**

**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBA4EM5	3	3	3	3	2
P22MBA4EM5	2	3	2	3	3
P22MBA4EM5	3	3	-	3	2
P22MBA4EM5	2	3	3	3	3
P22MBA4EM5	3	3	-	2	2
<b>Optimal Point</b>	2	3	3	3	2



Signature of the director

## **VI- COMMERCIAL BANKING MANAGEMENT**

**Second Year**  
**Elective CourseB:Finance**  
**Code:P22MBA4EF1**

**Semester – IV**  
**Credit –4**

### **COURSE OBJECTIVES**

- To impart knowledge of the functions of commercial and thrift banking institutions as well as other financial service providers.
- To understand the evolution of banking, the organizational structure of banks, and how banking and other financially related legislation and regulation have impacted the operation of today's financial companies.
- Familiarize commercial bank operations, importance of risk management in their operations, and how they compete in the market place with other financial service providers

### **UNIT – I INTRODUCTION**

Meaning and types of banks - services provided by banks - bank and its competitors in the financial system - key trends affecting banks.

### **UNIT – II THE BANK REGULATORY ENVIRONMENT**

The need for regulation, banking regulations – commercial banking act (Banks and Financial Institutions Act), directives of RBI to commercial banks - Role of RBI in the regulation of commercial banks.

### **UNIT – III ORGANIZATION AND STRUCTURE OF COMMERCIAL BANKING INDUSTRY**

The organization and structure of the commercial banking industry - internal organization of banking firm; types of banking organizations: unit banking organizations, branch banking organizations, bank holding company organizations; and financial holding companies and bank subsidiaries.

### **UNIT – IV ESTABLISHING BANKS AND BANK BRANCHES**

Establishing a new bank - factors affecting the decision to establish a new bank- bank chartering process; opening a new branch; branch regulation, changing role of bank branches; establishing automated limited-service facilities; point-of-sale terminals; automated teller machines; home and office banking; telephone banking and call centers; internet banking- RBI policy on establishing banks and bank branches.

### **UNIT – V THE FINANCIAL STATEMENTS OF BANKS**

An overview of bank balance sheet and income statement - the balance sheet: the assets of a bank, liabilities of a bank; off-balance sheet items; income statement and its components – auditing - RBI guidelines on bank's financial statements.

## **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary issues Related to Commercial Banking Management - Practical: studying in BankRegulatory Environment- Group discussions and Case Study on Banking Sector.

### **TEXT BOOKS**

1. Rose, P. S. & Hudgins, S. C. (2010). Bank management and financial services. New Delhi:Tata McGraw-Hill Education.
2. Gup, B. E. & Kolari, J. W. (2005). Commercial banking. New Delhi: Willey India.
3. Sivasubramaniam, A. (2020). Customers Perception towards Retail Banking Service of Commercial Bank. Van Haren Publishing.
4. Mohanty, A. R. (2014). Risk Management and Capital Measurement in Commercial Banks.Amsterdam University Press.
5. Kammert, J. L. (1981). International Commercial Banking Management. AMACOM.

### **REFERENCES**

1. McDonald, S. S. & Koch, T. W. Management of banking. The Dryden Press, HarcourtCollege Publishers.
2. Gestel, T. V. & Baensens, B. Credit risk management. New York: Oxford University Press.
3. Chatterjee, A. Credit management: A practical approach. New Delhi: Skylark Publications.
4. Koirala, P. Essentials of commercial bank management. Kathmandu: Ekta Books.

### **E-RESOURCES**

1. <https://www.classcentral.com/course/swayam-management-of-commercial-banking-17680>
2. [https://onlinecourses.nptel.ac.in/noc21\\_mg15/preview](https://onlinecourses.nptel.ac.in/noc21_mg15/preview)
3. <https://www.coursera.org/courses?query=banking>
4. <https://www.moodysanalytics.com/course-catalog-learning-solutions/commercial-banking>
5. <https://www.careers360.com/courses-certifications/free-banking-courses>

### **COURSE OUTCOMES**

After completion of this course, the student will be able to

- Compare and contrast all types of regulations of the Commercial Banking Industry.
- Distinguish and classify all aspects of Commercial Bank.
- Analyze Asset-Liability Management Techniques and related hedging techniques.
- Familiarity with the key banking regulations and financial legislation that govern the operations of financial companies, ensuring stability, consumer protection, and adherence to ethical standards.
- Knowledge of the historical development of banking from ancient times to modern banking systems, including the evolution of financial instruments and practices.

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## VI-COMMERICAL BANKING MANAGEMENT(P22MBA4EF1)

## MAPPING

CO -PO-PSO matrices of course

K1:Low K2: Moderate K3: Substantial

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
P22MBA4EF1	3	3	3	3	2
P22MBA4EF1	2	3	2	3	3
P22MBA4EF1	3	3	2	3	2
P22MBA4EF1	2	3	3	3	3
P22MBA4EF1	3	3	3	2	2
<b>Optimal Point</b>	3	3	3	3	2



Signature of the director

## **IX-GLOBAL FINANCIAL MANAGEMENT**

**Second Year**  
**Elective CourseB:Finance**  
**Code: P22MBA4EF4**

**Semester – IV**  
**Credit –4**

### **COURSE OBJECTIVES**

- Understand the various stages of expansion overseas, in order to benefit from globalization.
- Familiarize the international monetary system and foreign exchange markets.
- Examine the Balance of Payments (BOP) data and determine its implications for international competition.

### **UNIT – I INTERNATIONAL FINANCIAL ENVIRONMENT**

The Importance, rewards & risk of international finance- Goals of MNC- International Business methods – Exposure to international risk- International Monetary system- Multilateral financial institution

### **UNIT – II INTERNATIONAL FLOW OF FUNDS AND INTERNATIONAL MONETARY SYSTEM**

International Flow of Funds: Balance of Payments (BoP), Fundamentals of BoP, Accounting components of BOP, Factors affecting International Trade and capital flows, Agencies that facilitate international flows. BOP, Equilibrium & Disequilibrium. Trade deficits. Capital account convertibility (problems on BOP) International Monetary System: Evolution, Gold Standard, Bretton Woods system, the flexible exchange rate regime, the current exchange rate arrangements, the Economic and Monetary Union (EMU).

### **UNIT – III FOREIGN EXCHANGE MARKET**

Function and Structure of the Forex markets, foreign exchange market participants, Types of transactions and Settlements Dates, Exchange rate quotations, Nominal, Real and Effective exchange rates, Determination of Exchange rates in Spot markets. Exchange rates determinations in Forward markets. Exchange rate behaviour- Cross Rates- - Arbitrage profit in foreign exchange markets, Swift Mechanism. Triangular and locational arbitrage.

### **UNIT – IV INTERNATIONAL FINANCIAL MARKETS AND INSTRUMENTS**

Foreign Portfolio Investment. International Bond & Equity market. GDR, ADR, Cross listing of shares Global registered shares. International Financial Instruments: Foreign Bonds & Eurobonds, Global Bonds. Floating rate Notes, Zero coupon Bonds, International Money Markets International Banking services –Correspondent Bank, Representative offices, Foreign Branches. Forward Rate Agreements.

### **UNIT – V INTERNATIONAL PARITY RELATIONSHIPS & FORECASTING FOREIGN EXCHANGE RATE**

Measuring exchange rate movements-Exchange rate equilibrium – Factors effecting foreign exchange rate- Forecasting foreign exchange rates. Interest Rate Parity, Purchasing Power Parity & International Fisher effect. Covered Interest Arbitrage

### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only) :**

Contemporary issues Related to global financial management - Practical: studying foreign exchange rate - Group discussions and Case Study on – international financial market



## TEXT BOOKS

1. Jeff Madura , International Financial Management - , Cengage Learning 2008.
2. Eun& Resnick International Finance Management - Tata McGraw Hill. 4/e.
3. MadhuVij, International Financial Management –Excel BOOKS, 2010.
4. Apte P. G, International Financial Management – TMH, 2011,6/e.
5. Eiteman, Moffett and Stonehill, Multinational Business Finance – , Pearson, 2011, 12/e.

## REFERENCES

1. Siddaiah T, International Financial Management –Pearson, 2011, 1/e.
2. ImadMoosa, International Finance – Tata McGraw Hill, 2011, 3/e.
3. Vyuptakesh Sharan, International Financial Management – PHI, 2011, 6/e.
4. Alan C. Shapiro, Multinational Financial Management–Wiley India Pvt. Ltd,2011,10/e.
5. Jain, Peyrard & Yadav, International Financial Management –Macmillan 2010.
6. Thomas O’Brien, International Finance –Oxford University Press, 2010.

## E-RESOURCES

1. <https://www.coursera.org/courses?query=financial%20management>
2. <https://www.edx.org/learn/financial-management>
3. <https://alison.com/course/diploma-in-international-finance>
4. <https://coursesity.com/free-tutorials-learn/financial-management>
5. <https://www.mbacentral.org/free-online-finance-courses/>

## COURSE OUTCOMES

On completion of this course, the students will be able to

- Understand international capital and foreign exchange market
- Identify and appraise investment opportunities in international environment
- Identify risk relating to exchange rate fluctuations and develop strategies to deal with them
- Identify and evaluate foreign direct investment and international acquisition opportunities
- Develop strategies to deal with other types of country risks associated with foreign operations

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SEMESTER IV

ELECTIVE COURSEB:FINANCE

**IX-GLOBAL FINANICAL MANAGEMENT(P22MBA4EF4)**

**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
P22MBA4EF4	3	3	3	3	3
P22MBA4EF4	3	2	3	3	3
P22MBA4EF4	3	2	3	3	2
P22MBA4EF4	3	3	3	3	-
P22MBA4EF4	3	3	3	2	2
<b>Optimal Point</b>	3	2.6	3	2.8	2



**Signature of the director**

## **X-MERCHANT BANKING**

**Second Year**  
**Elective CourseB:Finance**  
**Code: P22MBA4EF5**

**Semester – IV**  
**Credit –4**

### **COURSE OBJECTIVES**

- Provide an overview of merchant banking, its functions, and its role in the financial services industry.
- Gain insights into providing corporate finance solutions, financial restructuring, and strategic advisory services to corporate clients.
- Emphasize the importance of ethical practices, client confidentiality, and professionalism in merchant banking.

### **UNIT – I      MERCHANT BANKING**

Introduction – An Overview of Indian Financial System – Merchant Banking in India – Recent Developments and Challenges ahead – Institutional Structure – Functions of Merchant Bank - Legal and Regulatory Framework – Relevant Provisions of Companies Act-SEBI Guidelines - FEMA- Relation with Stock Exchanges and OTCEI.

### **UNIT – II      ISSUE MANAGEMENT**

Role of Merchant Banker in Appraisal of Projects, Designing Capital Structure and Instruments – Issue Pricing – Book Building – Preparation of Prospectus Selection of Bankers, Advertising Consultants, etc. - Role of Registrars –Bankers to the Issue, Underwriters, and Brokers. – Offer for Sale – Green Shoe Option – E-IPO, Private Placement – Bought out Deals – Placement with FIs, MFs, FIIs, etc. Off - Shore Issues. – Issue Marketing – Advertising Strategies – NRI Marketing –PostIssue Activities.

### **UNIT - III      FEE BASED SERVICES**

Mergers and Acquisitions – Portfolio Management Services – Credit Syndication – Credit Rating – Business Valuation.

### **UNIT – IV      FUND BASED FINANCIAL SERVICES**

Leasing and Hire Purchasing – Basics of Leasing and Hire purchasing – Financial Evaluation.

### **UNIT – V      FUND BASED FINANCIAL SERVICES**

Consumer Credit – Credit Cards – Real Estate Financing – Bills Discounting – factoring and Forfeiting – Venture Capital.

### **UNIT – VI      CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary Developments Related to Merchant Banking - Practical: Studying Functions of Merchant Bank and Portfolio Management Services- Mini Project on Fund based Financial Services -Group discussions.

## TEXT BOOKS

1. M.Y. Khan, Financial Services, Tata McGraw-Hill, 12th Edition, 2012
2. Nalini Prava Tripathy, Financial Services, PHI Learning, 2011.
3. Machiraju, Indian Financial System, Vikas Publishing House, 2nd Edition, 2010.
4. J.C.Verma, A Manual of Merchant Banking, Bharath Publishing House, New Delhi, 2016
5. Varshney P.N. & Mittal D.K., Indian Financial System, Sultan Chand & Sons, New Delhi, 2018.
6. Sasidharan, Financial Services and System, Tata McGraw Hill, New Delhi, 2014.

## REFERENCE BOOKS

1. World Wealth Report by Capgemini and Merrill Lynch, 2017.
2. Dun & Bradstreet, Wealth Management, Tata McGraw-Hill education, 2019.
3. Robert D Manning, Credit card Nation, Basic Books, 2020.
4. Merchant Banking and Financial Services, Prof. Anil Agashe, Everest Publishing House, 2015.
5. Merchant Banking and Financial Services, Dr. S. Guruswami, McGraw Hill Education Pvt(Ltd), Fourth edition, 2014.
- 6.

## E-RESOURCES

1. <https://alison.com/tag/banking>
2. [https://www.onlinenifm.com/module\\_detail/48/merchant-banking-nism-series-ix-certificate-course](https://www.onlinenifm.com/module_detail/48/merchant-banking-nism-series-ix-certificate-course)
3. <https://www.classcentral.com/course/edx-banking-financial-intermediation-concepts-risks-capital-regulation-11717>
4. <https://www.edx.org/learn/banking>
5. <https://corporatefinanceinstitute.com/course/introduction-to-banking-course/>

## COURSE OUTCOMES

On completion of this course, the students will be able to

- Knowledge of banking and financial concepts, related to investment in primary market and secondary market.
- Familiarize the concepts of SEBI, FEMA, OTCEI, E-IPOs, FIs, MFs and FIIs.
- Understand the role and functions of the financial system, with reference to the macro economy.
- Demonstrate an awareness of the current structure and regulations of the Indian financial services sector.
- Evaluate and create strategies to promote financial products and services.

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**X-MERCHANT BANKING (P22MBA4EF5)**  
**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
P22MBA4EF5	3	3	3	3	3
P22MBA4EF5	3	2	3	3	3
P22MBA4EF5	3	3	2	3	2
P22MBA4EF5	2	3	3	3	-
P22MBA4EF5	3	2	3	2	3
<b>Optimal Point</b>	3	3	3	3	3

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**Signature of the director**

## **VI-HUMAN RESOURCE ANALYTICS**

**Second Year**

**Elective Course C: Human Resource Management**

**Code: P22MBA4EH1**

**Semester – IV**

**Credit – 4**

### **COURSE OBJECTIVES**

- Develop problem solving skills using quantitative methods to analyze, segment and perform rootcause
- Understand emerging data and metric standards in HR and human capital as well their application, integration and impact upon financial and business outcomes with real-world HR and talent issues and available data in organizations today.
- Learn when and how to segment, test, and apply simple and advanced metrics to transform data into intelligence for insight and predictions.

### **UNIT – I HR ANALYTICS IN PERSPECTIVE**

Role of Analytics, Defining HR Analytics, HR Analytics: The Third Wave for HR value creation, HR Measurement journey in tune with HR maturity journey Understanding the organizational system (Lean), Locating the HR challenge in the system, Valuing HR Analytics in the organizational system.

### **UNIT – II HRA FRAMEWORKS**

Current approaches to measuring HR and reporting value from HR contributions, Strategic HR Metrics versus Benchmarking, HR Scorecards & Workforce Scorecards and how they are different from HR Analytics, HR Maturity Framework: From level 1 to level 5, HR Analytics Frameworks:

(a) LAMP framework; (b) HCM:21 Framework and (c) Talent ship Framework, 5 overarching components of an effective Analytics framework.

### **UNIT – III BASICS OF HR ANALYTICS**

What is Analytics?, Basics of HR Analytics, Evolution, Analytical capabilities, Analytic value chain, Analytical Model, Typical application of HR analytics.

### **UNIT – IV INSIGHT INTO DATA DRIVEN HRA**

Typical data sources, Typical questions faced (survey), Typical data issues, Connecting HR Analytics to business benefit, Techniques for establishing questions, building support and interest, obtaining data, Cleaning data, Supplementing data.

### **UNIT – V HR METRICS**

Defining metrics, Demographics, data sources and requirements, Types of data, tying data sets together, Difficulties in obtaining data, ethics of measurement and evaluation. Human capital analytics continuum.

### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary issues Related to the HRA Frameworks- Practical: Studying Developing HR metrics used in manufacturing companies. - Mini Project on HR Dashboards -practices in MNCs - role play, Group discussion

## TEXT BOOKS

1. HR Analytics Essentials You Always Wanted to Know, Dr. Michael Walsh, Vibrant Publishers,2017.
2. HR Analytics: Connecting Data and Theory, Rama Shankar Yadav, Sunil Maheshwari, Wiley,2020
3. Hr Analytics: Understanding Theories and Applications, Dipak Kumar Bhattacharyya, SagePublications, 2017.
4. Predictive analytics for Human Resources, Jac Fitz- enz, John R. Mattox, Wiley, 2015.
5. Human Capital Analytics: Gene Pease Boyce Byerly, Jac Fitz-enz, Wiley,2016.

## REFERENCE

1. The HR Scorecard: Linking People, Strategy, and Performance, Brian E. Becker, Mark A.Huselid, Mark A Huselid, David Ulrich, 2015.
2. HR Analytics: The What, Why and How, Tracey Smith the New HR Analytics: Predicting theEconomic Value of Your Company's Human, Jac FITZ-ENZ, 2016.
3. Moore, McCabe, Duckworth, and Alwan. The Practice of Business Statistics: Using Data forDecisions, Second Edition, New York: W.H.Freeman, 2014.
4. Applying Advanced Analytics to HR Management Decisions: Methods for Selection, DevelopingIncentives, and Improving Collaboration, C. Sesil James, Pearson, 2017.
5. HR Analytics and Innovations in Workforce Planning, Tony Miller, CABI Publishing, 2016.

## E-RESOURCES

1. <https://www.coursera.org/learn/human-resources-analytics>
2. <https://www.classcentral.com/course/human-resources-analytics-32615>
3. <https://www.udemy.com/course/hr-data-fundamentals/>
4. <https://courseconnected.com/free-online-hr-analytics-course/>
5. <https://ecornell.cornell.edu/certificates/human-resources/hr-analytics/>

## COURSE OUTCOMES

On completion of this course, the students will be able to

- Demonstrate the role and importance of HR analytics
- Master the tools and techniques required for HR metrics.
- Understand the ethical considerations in HR analytics.
- Recognize the impact of change on HR processes and practices.
- Understand that the judgment of HR professional is essential.

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**SEMESTERIV: ELECTIVE COURSEC:HUMAN RESOURCE MANAGEMENT**

**VI-HUMAN RESOURCE ANALTYICS (P22MBA4EH1)  
MAPPING**

**CO -PO–PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBA4EH1	3	3	3	3	3
P22MBA4EH1	3	2	3	3	3
P22MBA4EH1	3	2	2	3	2
P22MBA4EH1	3	2	2	3	-
P22MBA4EH1	3	3	3	2	3
<b>Optimal Point</b>	3	3	3	3	2



**Signature of the director**



## VII-TRAINING AND DEVELOPMENT

**Second Year**

**Elective Course C: Human Resource Management**

**Code: P22MBA4EH2**

**Semester – IV**

**Credit – 4**

### **COURSE OBJECTIVES**

- Understand the ethical considerations in training and development.
- Understand the role of employee development and career planning.
- Familiarize students with the training and development function.

### **UNIT – I**

HRD: Definition, Evolution of HRD from Personnel management, Developmental Perspective of HRD, HRD at macro and micro levels: Outcomes of HRD in the national and organizational contexts. Qualities and Competencies required in a HRD professional. Importance of HRD in the present context. Development of HRD Movement in India.

### **UNIT – II**

Development Human Capacity: Meaning and Scope of training, education and development. Aptitude, Knowledge, Values, Skills of Human Relations, Responsiveness, Loyalty and Commitment, Transparency, Leadership development. Training and Development: Role, Responsibilities and challenges to Training Managers.

### **UNIT – III**

Evaluating HRD: Human Resource Accounting- approaches, HR Audit and Bench marking, HR balanced scorecard, Assessment Center, Performance appraisal including 360-degree appraisal, Impact-assessment of HRD initiatives on Organizations.

### **UNIT – IV**

Human Resource Training and Development : Concept and Importance; Assessing Training Needs; Designing and Evaluating T&D Programmes; Types of training: Internal and external, Outbound Training, Attitudinal training, Training effectiveness. HRD concepts, Subsystems of HRD: Human Resource Planning, Potential Appraisal, Career Planning & Succession Planning.

### **UNIT – V**

Recent Trends in HRD and OD: Training for trainers and HRD professionals, Promoting Research in HRD and OD. Impact of development in the other fields such as Psychology, Business Management, Communication and Information Technology,

### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary issues Related to the Course during the Semester concerned - Practical: Studying Training & Development of two Indian institutions in the lime-light- Mini Project on TraininG and development – Inculcating the skill of developing the T&D module for organization - role play, Groupdiscussion

## TEXT BOOKS

1. Handbook of Training and Development (Hrm in Action), Second edition, Steve, United Kingdom: Blackwell publisher Ltd, 2017.
2. Training & Development, B. Janakiram, Dreamtech Press, 2016.
3. Employee Training and Development, Raymond Noe, Amitabh Deo Kodwani, McGraw Hill Education, 2017.
4. Training And Development: Theories And Applications: Theory And Applications, Dipak Kumar Bhattacharyya, Sage, 2015
5. Training & Development, Steven A. Beebe, Timothy P. Mottet, K. David Roach, Pearson Education, 2019

## REFERENCE BOOKS

1. French W.L. & Bell, Jr, C.H., Organization Development: Behavioural Science Interventions for Organization Development. New Delhi: Prentice Hall of India.
2. Argyrs, Chris: Organizational Learning: A Theory of Action Perspective. Readings, Mass-Addison –Wesley
3. Khardelwal Anil K., Abraham, S.J., Verma K.K., Alternative Approaches and Strategies of HRD, National HRD Network, Rawat Publications, Jaipur,
4. Maheshwari, B.L., Dharni, P. Sinha, Management of Change through HRD, National HRD Network, Hyderabad, Tata McGraw Hill
5. D.M. Silvera. Human Resource Development: The Indian Experience. New Delhi: New India Publications.

## E-RESOURCES

1. <https://www.coursera.org/courses?query=learning%20and%20development>
2. [https://onlinecourses.nptel.ac.in/noc22\\_hs63/preview](https://onlinecourses.nptel.ac.in/noc22_hs63/preview)
3. <https://www.futurelearn.com/courses/training-development-work>
4. <https://www.classcentral.com/course/training-development-work-13772>
5. <https://www.udemy.com/topic/learning-and-development/>

## COURSE OUTCOMES

On completion of this course, the students will be able to

- Understand the need and process of training needs analysis in organizations.
- Understand the process of designing a training programme and its evaluation.
- Understand various training methods and their applicability in different organizational situations.
- Comprehend the tools and techniques of management development.
- Analyse problems and provide solutions to enable effective presentation of input and activities

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**SEMESTERIVELECTIVE COURSEC:HUMAN RESOURCE MANAGEMENT**

**VII-TRAINING AND DEVELOPMENT (P22MBA4EH2)**

**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBA4EH2	3	3	3	2	3
P22MBA4EH2	3	2	3	2	3
P22MBA4EH2	3	2	3	3	3
P22MBA4EH2	2	3	2	3	-
P22MBA4EH2	2	3	2	2	2
<b>Optimal Point</b>	3	3	3	2	3



**Signature of the director**

## **MANGERIAL INTERPERSONAL EFFECTIVENESS**

**Second Year**

**Semester – IV**

**Elective Course C: Human Resource Management**

**Credit – 4**

**Code: P22MBA4EH4**

### **COURSE OBJECTIVES**

- Understand the Importance of Interpersonal Relationships in HRM.
- Effective communication skills which are critical in such interpersonal relationships.
- It aids students in the development of personal strengths and self-awareness that contribute to communication skills and positive relationship
- 

### **UNIT – I SELF PERCEPTION AND SELF-PRESENTATION**

Defining & perceiving self, gaining self-knowledge, self-effectiveness, self-presentation, self-presentation motives and strategies, impression management, self-monitoring

### **UNIT - II COMMUNICATION**

Communication & language, Non-verbal communication, proxemics (interpersonal space) paralanguage, kinesics, deception, detection, non-verbal leakage.

### **UNIT – III ATTITUDE AND ATTITUDE CHANGE**

The nature of attitude, changing attitudes – theoretical perspectives, changing attitudes through persuasion, Avoiding measurement pitfalls, conditions promoting and reducing consistency.

### **UNIT – IV ENVIRONMENTAL INFLUENCE**

Territoriality, crowding, environmental quality and social behavior, impact on our surroundings.

### **UNIT – V QUALITY OF WORK LIFE (QWL)**

Quality of Work Life: Working and well-being, the working woman and the stress on working women. Public health, aging and life quality using social psychology to improve quality of work life.

### **UNIT – VI CURRENT CONTOURS (For Continuous Internal Assessment only)**

Contemporary issues Related to Managing Interpersonal Effectiveness - Practical: Studying influence of environmental factors on interpersonal management - Mini Project on QWL of two Indian companies – Group discuss

## **TEXT BOOKS**

- Behaviour in Organisations, Jerald Greenberg and Robert. A. Baron, PHI learning India, 2019.
- Influencing and Interpersonal Effectiveness, Jacqueline Mansell, FCM Publishing, 2019.
- Cultural Interpersonal Effectiveness, Trevor Sherman, 2020.
- Organisational behavior, S. FayyazAhamed, Atlantic publishers, 2017.
- Managing Interpersonal Effectiveness, P M Meera Mohiadeen, Nahidha Publication, 2018.

## **REFERENCE**

- Essential social Psychology, Riso. R.J and Turner R.N., ThousandOaks, CA; InternationalEdition, Sage publication, 2014.
- OrganisationalBehaviour, John. W. Newstrom, Tata Mcgraw Hill, Special Indian Edition, 2018.
- Working Woman and the stress organisationalbehaviour, Steeven L. MC Shane, Tata Mcgrawhill. 2016
- Network Marketing - Recruiting & Retailing Mastery: Negotiation, Walker, J. S., Jw Choices,2020.
- Managing Negative Emotions: How to deal with anger, anxiety, and irritation anywhere andanytime, Neal, B., Independently published, 2018.

## **E-RESOURCES**

- <https://alison.com/course/introduction-to-interpersonal-skills>
- <https://www.oxfordhomestudy.com/courses/leadership-courses-online/free-interpersonal-skills-training>
- <https://www.classcentral.com/course/swayam-interpersonal-skills-14135>
- <https://www.futurelearn.com/courses/communication-and-interpersonal-skills-at-work>
- [https://onlinecourses.nptel.ac.in/noc19\\_hs36/preview](https://onlinecourses.nptel.ac.in/noc19_hs36/preview)

## **COURSE OUTCOMES**

On completion of this course, the students will be able to

- Describe and critically analyse the components of effective interpersonal communication skills.
- Use self-analysis and reflections to examine personal communication styles, attitudes, beliefs and values that underlie them.
- Employ interpersonal communication skills to establish and enhance personal and work- basedrelationships.
- Utilize effective communication skills appropriate to the purpose, audience, and situation.
- Understand the drivers and motivators of others.

**SEMESTERIVELECTIVE COURSE C: HUMAN RESOURCE MANAGEMENT**

**IX-MANAGING INTERPERSONAL EFFECTIVENESS  
(P22MBA4EH4)**

**MAPPING**

**CO -PO-PSO matrices of course**

K1:Low K2: Moderate K3: Substantial

<b>PO/PSO CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
P22MBA4EH4	3	3	3	3	3
P22MBA4EH4	3	3	3	3	2
P22MBA4EH4	3	3	3	3	2
P22MBA4EH4	3	3	3	3	-
P22MBA4EH4	3	3	3	2	2
<b>Optimal Point</b>	3	3	3	3	2



**Signature of the director**

**UG DEPARTMENT OF ENGLISH**  
**SHRIMATI INDIRA GANDHI COLLEGE**  
**(Nationally Accredited at A Grade (3rd Cycle) by NAAC)**  
**(Affiliated to Bharathidasan University)**  
**Tiruchirappalli 620 002**

**Programme Outcomes in Arts (UG) (PO)**

- PO1: Understand LSRW and apply knowledge of human communication and language processes.
- PO2: Prepare culture and praise worthy as a citizen of India.
- PO3: Examine employment / entrepreneurship opportunities.
- PO4: Understand the fundamental values /principles of Indian consciousness.
- PO5: Ability to use communication and soft skills effectively.

**B.A., English Programme Specific Outcome (PSO)**

- PSO1: The basic aim in pursuing B.A. English Literature is to think creatively and analytically about the English language in its varied forms.
- PSO2: This requires critical Listening, Speaking, Reading and Writing as an effective basis of literary inquiry in association with literary contexts. These skills include clear expression and sound mechanics that can be practiced through creative writing, research and critical argument.
- PSO3: It also employs understanding of literature as a basis of literary inquiry. These contexts include: the influences of culture, race and gender -genre, literary traditions and historical periods: literary production and the insights of literary theories.

PSO4: All the above outcomes are developed through class discussion including film, visual media and performance.

PSO5: An English language-focused degree will train students to analyse the working of the English language outside literature, including language-based communication in all kinds of forms and contexts.

PSO6: B.A. English degree can lead to a wide range of careers. The graduates can work in areas such as professional writing, publishing, teaching, IT, law (by conversion course), education policy, event management, leisure and tourism management, marketing and journalism.



## **SEMESTER -1**

### **CORE COURSE I 16ACCEN1: PROSE**

#### **Unit – I**

Francis Bacon : “Of Studies”

John Milton : “Books”

#### **Unit – II**

Joseph Addison : “Periodical Essays”

Richard Steele : “The Spectator Club”

#### **Unit – II**

William Hazlitt : “On Going a Journey”

Charles Lamb : “Dream-Children; A Reverie”

#### **Unit – IV**

R. L Stevenson : “An Apology for Idlers”

Robert Lynd : “The Pleasures of Ignorance”

#### **Unit – V**

A.G. Gardiner : “On the Rule of the Road”

E.V. Lucas : “On Finding Things”

#### **Course Outcomes:**

- To develop the love for natural objects.
- To give certain facts and lessons through the story.
- To develop the language ability of the learners.
- To do intense study of the students.
- To shape the students' character

## 16ACCEN1: PROSE

### MAPPING

CO-PO-PSO matrix of course

1.Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / Co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	-	2	3	2	2	-	2	3
CO	3	-	2	3	2	2	-	2	3
CO	2	-	2	3	2	3	-	3	2
CO	2	-	3	2	3	2	-	2	3
CO	2	-	2	3	2	2	-	3	3
Average	2.4	-	2.2	2.8	2.4	2.2	-	2.4	2.8

**CORE COURSE II**  
**16ACCEN2: SHORT STORIES**

**Unit – I (British)**

Saki : “Alice and the Liberal Party”

Somerset Maugham : “The Verger”

**Unit – II (Indian)**

Rabindranath Tagore : “The Postmaster”

Lakshmi Kannan : “Muniyakka”

**Unit – III (Russian)**

Anton Chekhov : “The Bet”

Leo Tolstoy : “The Candle”

**Unit – IV (American)**

Nathaniel Hawthorne : “The Snow-Image”

Edgar Allan Poe : “The Purloined Letter”

**Unit – V (New Zealand & African)**

Katherine Mansfield : “An Ideal Family”

Chinua Achebe : “The Sacrificial Eggs”

**Course Outcomes:**

- Analyze the art of story telling and the various structural elements.
- Instituting comparisons with various Literary Movements to help deconstructing texts with greater clarity.
- Reconstruct an expression of the human experience.
- Creates a short narrative story with collaboration.

## 16ACCEN2: SHORT STORIES

### MAPPING

CO-PO-PSO matrice of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	3	3	3	3	3	3	3
CO	3	3	2	2	2	2	3	2	3
CO	2	3	2	3	3	3	2	3	2
CO	3	2	3	3	2	2	3	2	3
CO	2	2	2	2	3	3	2	3	2
Average	2.6	2.8	2.8	2.6	2.6	2.6	2.6	2.6	2.6

## **16AACEN1: ALLIED COURSE I**

### **SOCIAL HISTORY OF ENGLAND**

#### **Unit – I**

Medieval and Tudor England – Renaissance, Reformation

#### **Unit – II**

The Civil War and the Restoration England

#### **Unit – III**

The Age of Queen Anne

#### **Unit – IV**

The Victorian Age

#### **Unit – V**

Twentieth Century

#### **Course Outcomes:**

- To learn the social history of England and acquire general knowledge about the old period, the medieval or middle period and the modern period of England in a political perspective.
- Correlate the socio-political history with the literary history of English and will be able to perceive how the land's literature reflects or/and refracts the nation's history.
- Decipher that the knowledge of socio-political history would enable them to get familiarized with representative literary and cultural texts within a significant span of historical, geographical, and cultural contexts.
- Identify, analyse, interpret and describe the critical ideas, values and themes that appear in literary and cultural texts of various genres.
- Comprehend the evolution of the history of literary genres as contextualised in a land's social history.

## 16AACEN1: SOCIAL HISTORY OF ENGLAND

### MAPPING

#### CO-PO-PSO matrice of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	3	3	3	3	3	3	3
CO	3	3	2	2	2	2	3	2	3
CO	2	3	2	3	3	3	2	3	2
CO	3	2	3	3	2	2	3	2	3
CO	2	2	2	2	3	3	2	3	2
Average	2.6	2.8	2.8	2.6	2.6	2.6	2.6	2.6	2.6

## **20CEL1: Communicative English-I**

### **Unit I (20 hours)**

1. Listening and Speaking
  - a. Introducing self and others
  - b. Listening for specific information
  - c. Pronunciation (without phonetic symbols)
    - i. Essentials of pronunciation
    - ii. American and British pronunciation
2. Reading and Writing
  - a. Reading short articles – newspaper reports / fact based articles
    - i. Skimming and scanning
    - ii. Diction and tone
    - iii. Identifying topic sentences
  - b. Reading aloud: Reading an article/report
  - c. Journal (Diary) Writing
3. Study Skills - 1
  - a. Using dictionaries, encyclopaedias, thesaurus
4. Grammar in Context:  
Naming and Describing  
Nouns & Pronouns  
Adjectives

### **Unit II (20 hours)**

1. Listening and Speaking
  - a. Listening with a Purpose
  - b. Effective Listening
  - c. Tonal Variation
  - d. Listening for Information
  - e. Asking for Information
  - f. Giving Information

## Reading and Writing

### 1. a. Strategies of Reading:

Skimming and Scanning

### b.Types of Reading

Extensive and Intensive Reading

c. Reading a prose passage

d. Reading a poem

e. Reading a short story

### 2.Paragraphs: Structure and Types

a. What is a Paragraph?

b. Paragraph structure

c. Topic Sentence

d. Unity

e. Coherence

f. Connections between Ideas: Using

Transitional words and expressions

g. Types of Paragraphs

### Study Skills II:

Using the Internet as a Resource

a. Online search

b. Know the keyword

c. Refine your search

d. Guidelines for using the Resources

e. e-learning resources of Government of India

f. Terms to know

### 4. Grammar in Context Involving Action-I

a. Verbs

b. Concord

## **Unit III (16 hours)**

### 1. Listening and Speaking

a. Giving and following instructions



- b. Asking for and giving directions
- c. Continuing discussions with connecting ideas

2. Reading and writing

- a. Reading feature articles (from newspapers and magazines)
- b. Reading to identify point of view and perspective (opinion pieces, editorials etc.)
- c. Descriptive writing – writing a short descriptive essay of two to three paragraphs.

3. Grammar in Context:

Involving Action – II

3

Verbals - Gerund, Participle,

Infinitive

Modals

**Unit IV (16 hours)**

- 1. Listening and Speaking
  - a. Giving and responding to opinions
- 2. Reading and writing
  - a. Note taking
  - b. Narrative writing – writing narrative essays of two to three paragraphs
- 3. Grammar in Context:

Tense

Present

Past

Future

**Unit V (18 hours)**

1. Listening and Speaking
  - a. Participating in a Group Discussion
2. Reading and writing
  - a. Reading diagrammatic information  
– interpretations maps, graphs and  
pie charts
  - b. Writing short essays using the  
language of comparison and  
contrast
3. Grammar in Context: Voice (showing the  
relationship between Tense and Voice

#### **COURSE OUTCOME**

- Help learners read and comprehend literary texts to communicate effectively
- Train learners to improve their comprehension and composition skills

## 20CEL1- COMMUNICATIVE ENGLISH 1

### MAPPING

CO-PO-PSO matrice of course

1.Slight(Low) 2.Moderate(Medium) 3.Substantial(High)

If there is no correlation,put -

Po/psO/ co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	-	2	2	3	2	3
CO	3	3	2	-	2	2	3	2	3
CO	2	2	-	-	2	-	-	3	2
CO	2	2	3	-	-	2	-	2	3
CO	2	2	2	-	-	2	2	-	-
Average	2.4	2.2	1.8	-	1.1	1.2	1.6	1.8	2.2

## **20PELAS1: PROFESSIONAL ENGLISH FOR ARTS & SOCIAL SCIENCES-I**

### **UNIT 1: COMMUNICATION**

1. Listening: Listening to instructions
2. Speaking: Telephone etiquette and Official phone conversations
3. Reading short passages (3 passages, one from each – History, Sociology/Social Work/ Psychology, English Literature)
5. Writing: Letters and Emails in professional context
6. Grammar in Context:
  - Wh and yes or no,
  - Q tags
  - Imperatives
7. Vocabulary in Context: Word formation - .
  - i) Creating antonyms using Prefixes
  - ii) Intensifying prefixes (E. g inflammable)  
Changing words using suffixes
    - A) Noun Endings
    - B) Adjective Endings
    - C) Verb Endings

### **UNIT 2: DESCRIPTION**

Listening – Listening to process description

Speaking - Role play

Formal: With faculty and mentors in academic environment, workplace communication

Informal: With peers in academic environment, workplace communication

Reading –Reading passages on social issue, psychological well-being, literary achievements/contributions

Writing – Writing sentence definitions (e.g. monarchy) and extended definitions (e.g. government)

Picture Description – Description of natural calamities and their impact on people/ Cultures and cultural practices

Grammar in Context: Connectives and linkers.

Vocabulary – Synonyms (register) - Compare & contrast expressions.

### **UNIT 3: NEGOTIATION STRATEGIES**

Listening - Listening to interviews of specialists / inventors in fields (Subject specific)

Speaking – Brainstorming. (mind mapping). Small group discussions (subject specific)

Reading – Longer Reading text. (Comprehensive passages)

Writing – Essay Writing (250 word essay on topics related to subject area, like recording business trans)

Grammar in Context: Active voice & Passive voice – If conditional - Collocations –Phrasal verbs

### **UNIT 4: PRESENTATION SKILLS**

Listening - Listening to presentation. Listening to lectures. Watching – documentaries (discovery / history channel)

Speaking –Short speech - Making formal presentations (PPT)

Reading – Reading a written speech by eminent personalities in the relevant field /Short poems / Short biography.

Writing - Writing Recommendations -Interpreting visuals - charts / tables/flow diagrams/charts

Grammar in Context – Modals

Vocabulary (register) - Single word substitution

## **UNIT 5: CRITICAL THINKING SKILLS**

Listening - Listening to advertisements/news and brief documentary films (with subtitles)

Speaking – Simple problems and suggesting solutions.

Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills  
(subject-specific)

Writing Studying problem and finding solutions- (Essay in 200 words)

Grammar-Make simple sentences

Vocabulary -Fixed expressions

### **Course Outcome:**

- Recognise their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar

## 20PELAS 1: Professional English for Arts& Social Sciences

### MAPPING

CO-PO-PSO matrice of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘

Po/psO/ co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	2	3	3	-	3	-	2	3	2
CO	2	2	3	-	-	2	-	2	2
CO	2	2	-	-	2	-	-	3	2
CO	2	2	3	-	-	2	-	2	3
CO	2	2	2	-	-	2	2	-	-
Average	2	2.2	2.2	-	2	1.2	0.8	2	1.8

# **20PELCM 1: PROFESSIONAL ENGLISH FOR COMMERCE AND MANAGEMENT-I**

## **UNIT 1: COMMUNICATION**

1. Listening: Listening to instructions
2. Speaking: Telephone etiquette and Official phone conversations
3. Reading short passages (3 passages selected from Commerce and Management)
5. Writing: Letters and Emails in professional context
6. Grammar in Context:
  - Wh and yes or no,
  - Q tags
  - Imperatives
- 7, Vocabulary in Context: Word formation - .
  - i) Creating antonyms using Prefixes
  - ii) Intensifying prefixes (E. g inflammable)  
Changing words using suffixes
    - A) Noun Endings
    - B) Adjective Endings
    - C) Verb Endings

## **UNIT 2: DESCRIPTION**

Listening – Listening to process description

Speaking - Role play

Formal: With faculty and mentors in academic environment, workplace communication

Informal: With peers in academic environment, workplace communication Reading

–Reading passages on trade/commerce/management

Writing – Writing sentence definitions (e.g. ledger ) and extended definitions (e.g. accountancy)



Picture Description – Description of fashion and beauty products (a small write-up promoting the product/an objective review of the product in 150 to 200 words). Grammar in Context: Connectives and linkers.

Vocabulary – Synonyms (register) - Compare & contrast expressions.

### **UNIT 3: NEGOTIATION STRATEGIES**

Listening - Listening to interviews of specialists / inventors in fields (Subject specific)

Speaking – Brainstorming. (mind mapping). Small group discussions (subject specific)

Reading – Longer Reading text. (Comprehensive passages)

Writing – Essay Writing (250 word essay on topics related to subject area, like recording business trans)

Grammar in Context: Active voice & Passive voice – If conditional – Vocabulary: - Collocations

–Phrasal verbs

### **UNIT 4: PRESENTATION SKILLS**

Listening - Listening to presentation. Listening to lectures. Watching – documentaries (discovery / history channel)

Speaking –Short speech - Making formal presentations (PPT)

Reading – Reading a written speech by eminent personalities in the relevant field /Short poems / Short biography.

Writing - Writing Recommendations

Interpreting visuals - charts / tables/flow diagrams/charts

Grammar in Context – Modals

Vocabulary (register) - Single word substitution

## **UNIT 5: CRITICAL THINKING SKILLS**

Listening - Listening to advertisements/news and brief documentary films (with subtitles)

Speaking – Simple problems and suggesting solutions.

Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills  
(subject-specific)

Writing Studying problem and finding solutions- (Essay in 200 words)

Grammar-Make simple sentences

Vocabulary -Fixed expressions

### **Course Outcome:**

- Recognise their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar

**20PELCM1: Professional English For Commerce & Management -I**

**MAPPING**

CO-PO-PSO matrix of course

2. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘

Po/psO/ co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	-	2	2	3	2	3
CO	3	3	2	-	2	2	3	2	3
CO	2	2	-	-	2	-	-	3	2
CO	2	2	3	-	-	2	-	2	3
CO	2	2	2	-	-	2	2	-	-
Average	2.4	2.2	1.8	-	1.2	1.6	1.6	1.8	2.2

## **20PELLS1: PROFESSIONAL ENGLISH FOR LIFE SCIENCES-I**

### **UNIT 1: COMMUNICATION**

1. Listening: Listening to instructions

2. Speaking: Telephone etiquette and Official phone conversations 3. Reading short passages (3 passages, one from each – Botany, Zoology, Biochemistry/Microbiology/Health)

5. Writing: Letters and Emails in professional context

6. Grammar in Context:

- Wh and yes or no,
- Q tags
- Imperatives

7, Vocabulary in Context: Word formation - .

i) Creating antonyms using Prefixes

ii) Intensifying prefixes (E. g inflammable)

Changing words using suffixes

A) Noun Endings

B) Adjective Endings

C) Verb Endings

### **UNIT 2: DESCRIPTION**

Listening – Listening to process description

Speaking - Role play

Formal: With faculty and mentors in academic environment, workplace communication

Informal: With peers in academic environment, workplace communication

Reading –Reading passages on plant world, animal world, health Writing – Writing sentence

definitions (e.g. species) and extended definitions (e.g. Taxonomy)

Picture Description – Description of creatures and their habitat Grammar in

Context: Connectives and linkers.

Vocabulary – Synonyms (register) - Compare & contrast expressions.

### **UNIT 3: NEGOTIATION STRATEGIES**

Listening - Listening to interviews of specialists / inventors in fields (Subject specific)

Speaking – Brainstorming. (mind mapping). Small group discussions (subject specific)

Reading – longer Reading text. (Comprehensive passages)

Writing – Essay Writing (250 word essay on topics related to subject area, like pollution, use of pesticides in cultivation, healthy lifestyle, environment consciousness)

Grammar in Context: Active voice & Passive voice – If conditional – Vocabulary: -Collocations

-Phrasal verbs

### **UNIT 4: PRESENTATION SKILLS**

Listening - Listening to presentation. Listening to lectures. Watching – documentaries

(discovery / history channel)

Speaking –Short speech - Making formal presentations (PPT)

Reading – Reading a written speech by eminent personalities in the relevant field /Short poems /

Short biography.

Writing - Writing Recommendations

Interpreting visuals - charts/ tables/flow diagrams/

Grammar in Context – Modals

Vocabulary (register) - Single word substitution

## **UNIT 5: CRITICAL THINKING SKILLS**

Listening - Listening to advertisements/news and brief documentary films (with subtitles)

Speaking – Simple problems and suggesting solutions.

Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills  
(subject-specific)

Writing Studying problem and finding solutions- (Essay in 200 words) Grammar-Make simple sentences

Vocabulary -Fixed expressions

### **Course Outcome:**

- Recognise their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar

## 20PELLS1: Professional English For Life Science -I

### MAPPING

CO-PO-PSO matrice of course

3. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘

Po/psO/ co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	-	2	2	3	2	3
CO	3	3	2	-	2	2	3	2	3
CO	2	2	-	-	2	-	-	3	2
CO	2	2	3	-	-	2	-	2	3
CO	2	2	2	-	-	2	2	-	-
Average	2.4	2.2	1.8	-	1.2	1.6	1.2	2.4	2.8

## **20PELPS1: PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES-I**

### **UNIT 1: COMMUNICATION**

1. Listening: Listening to instructions
2. Speaking: Telephone etiquette and Official phone conversations
3. Reading short passages (3 passages, one from each – Physics, Chemistry, Mathematics/Computer Science)
5. Writing: Letters and Emails in professional context
6. Grammar in Context:
  - Wh and yes or no,
  - Q tags
  - Imperatives
7. Vocabulary in Context: Word formation - .
  - i) Creating antonyms using Prefixes
  - ii) Intensifying prefixes (E. g inflammable)  
Changing words using suffixes
    - A) Noun Endings
    - B) Adjective Endings
    - C) Verb Endings

### **UNIT 2: DESCRIPTION**

Listening – Listening to process description

Speaking - Role play

Formal: With faculty and mentors in academic environment, workplace communication

Informal: With peers in academic environment, workplace communication

Reading –Reading passages on products, equipment and gadgets



Writing – Writing sentence definitions (e.g. computer) and extended definitions (e.g. artificial intelligence)

Picture Description – Description of Natural Phenomena Grammar in Context: Connectives and linkers.

Vocabulary – Synonyms (register) - Compare & contrast expressions.

### **UNIT 3: NEGOTIATION STRATEGIES**

Listening - Listening to interviews of specialists / inventors in fields (Subject specific)

Speaking – Brainstorming. (mind mapping). Small group discussions (subject specific)

Reading – longer Reading text. (Comprehensive passages)

Writing – Essay Writing (250 word essay on topics related to subject area, like pollution, use of pesticides in cultivation, merits and demerits of devices like mobile phones, merits and demerits of technology in development)

Grammar in Context: Active voice & Passive voice – If conditional - Collocations –Phrasal verbs

### **UNIT 4: PRESENTATION SKILLS**

Listening - Listening to presentation. Listening to lectures. Watching – documentaries (discovery / history channel)

Speaking –Short speech - Making formal presentations (PPT)

Reading – Reading a written speech by eminent personalities in the relevant field /Short poems Short biography.

Writing - Writing Recommendations

Interpreting visuals - charts / tables/flow diagrams/charts

Grammar in Context – Modals

Vocabulary (register) - Single word substitution

## **UNIT 5: CRITICAL THINKING SKILLS**

Listening - Listening to advertisements/news and brief documentary films (with subtitles)

Speaking – Simple problems and suggesting solutions.

Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills  
(subject-specific)

Writing Studying problem and finding solutions- (Essay in 200 words)

Grammar-Make simple sentences

Vocabulary -Fixed expressions

### **Course Outcome:**

- Recognise their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar

## 20PELPS1 :Professional English For Physical Sciences – I

### MAPPING

CO-PO-PSO matrice of course

4. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘

Po/ps0/ co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	-	2	2	3	2	3
CO	3	3	2	-	2	2	3	2	3
CO	2	2	-	-	2	-	-	3	2
CO	2	2	3	-	-	2	-	2	3
CO	2	2	2	-	-	2	2	-	-
Average	2.4	2.2	1.8	-	1.2	1.6	1.2	2.4	2.8

## SEMESTER- 3

### CORE COURSE V 16ACCEN5: POETRY II

#### Unit – I

William Wordsworth : “The Solitary Reaper”

S. T Coleridge : “Dejection: An Ode”

#### Unit – II

John Keats : “Ode to Nightingale”

P. B Shelley : “Ozymandias”

#### Unit – III

Robert Browning : “Andrea del Sarto”

Alfred Tennyson : “Break, Break, Break”

#### Unit – IV

W. B. Yeats : “Sailing to Byzantium”

Philip Larkin : “Ambulances”

#### Unit – V

T. S. Eliot : “Marina”

Ted Hughes : “Hawk Roosting”

#### Course Outcomes:

- Make learners sharpen their poetic sensibility and stylistic skills.
- Provide a comprehensive guide to English poetry, its development, its forms and movements, throughout the ages.
- Recognize poetry from a variety of cultures, languages and historic periods.
- Understand and appreciate poetry as a literary art.
- Analyse the various elements of poetry, such as diction, tone, form, genre, imagery, figures of speech, symbolism, theme, etc.

## 16ACCEN5 - POETRY II

### MAPPING

CO-PO-PSO matrix of course

5. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	3	3	3	3	3	2	3
CO	3	3	2	2	2	2	3	3	3
CO	2	2	2	3	2	3	2	3	2
CO	2	3	3	3	3	2	3	2	3
CO	3	2	2	3	2	3	2	2	2
Average	2.6	2.4	2.4	2.6	2.4	2.6	2.6	2.4	2.6

**CORE COURSE VI**  
**16ACCEN6: ONE-ACT PLAYS**

**Unit – I (British)**

J. M. Synge : “Riders to the Sea”

**Unit – II (Russian)**

Anton Chekov : “The Swan Song”

**Unit– III (American)**

Tennessee Williams : “Lord Byron’s Love Letter”

**Unit – IV (Indian)**

Asif Currimbhoy : “The Refugee”

**Unit – V (African)**

Erisa Kironde : “The Trick”

**Course Outcomes:**

- Interpret literary texts in English by nurturing and utilising their ability to understand drama in a skilled, knowledgeable and ethical manner.
- Conceptualize various types of drama especially the one act plays, the prescribed syllabus and analyse the effect they create in the audience or the readers.
- Understand the structure of the play and learn the dramatic devices used in writing the play.
- Develop reading, writing and analytical skills and communicate their ideas critically and creatively.
- Discern the various cultural and moral values associated with the texts which help them to become ethical communicators.

## 16ACCEN6: ONE-ACT PLAYS

### MAPPING

CO-PO-PSO matrix of course

1.Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	2	2	2	2	2	3
CO	3	3	2	2	2	2	2	2	3
CO	2	2	2	2	2	3	2	3	2
CO	2	2	3	2	3	2	2	2	3
CO	2	2	2	2	2	2	2	3	3
Average	2.4	2.2	2.2	2	2.2	2.2	2	2.4	2.8

**16AACEN3: ALLIED COURSE III**  
**HISTORY OF ENGLISH LITERATURE I**

**Unit– I**

Chapters II & III : The Age of Chaucer

**Unit– II**

Chapters IV & V : Development of Drama

**Unit – III**

Chapters VI, VII & VIII : The Age of Shakespeare

**Unit – IV**

Chapters IX & X : The Age of Milton

**Unit – V**

Chapters XI & XII : The Age of Dryden

**Course Outcomes:**

- Expose learners to the historical background, rise and fall of literary movements and their relationships to socio-political and socio-religious events.
- Understands the historical context of the writer and his society.
- Delineate major writers and their works in chronological order.
- Provides an insight into the social background through the literary genre.
- Gain knowledge about the evolution of national sensibility.



## 16AACEN3 – HISTORY OF ENGLISH LITERATURE – I

### MAPPING

CO-PO-PSO matrix of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
O if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	2	2	2	3	2	3
CO	3	3	2	3	2	2	3	2	3
CO	2	2	2	2	2	3	3	3	2
CO	2	2	3	3	2	2	3	2	3
CO	2	2	2	2	3	2	2	2	3
Average	2.4	2.2	2.2	2.4	2.2	2.2	2.8	2.2	2.8

## 16ELCE3 Drama for Effective Communication

William Shakespeare : The Merchant of Venice

### Course Outcome:

- They get an insight of different cultures and themes by reading drama.

### 16ELCE3 - Drama For Effective Communication

#### MAPPING

CO-PO-PSO matrixe of course

1.Slight(Low) 2.Moderate(Medium) 3.Substantial(High).

If there is no correlation,put -

Po/pso/ co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	-	2	2	3	2	3
CO	3	3	2	-	2	2	3	2	3
CO	2	2	-	-	2	-	-	3	2
CO	2	2	3	-	-	2	-	2	3
CO	2	2	2	-	-	2	2	-	-
Average	2.4	2.2	1.8	-	1.2	1.6	1.6	1.8	2.2

## **SEMESTER- 5**

### **CORE COURSE IX**

#### **16ACCEN9: SHAKESPEARE**

##### **Unit – I**

A Midsummer Night's Dream

##### **Unit – II**

Julius Ceasar

##### **Unit– III**

King Lear

##### **Unit – IV**

Twelfth Night

##### **Unit – V**

Shakespearean Theatre and Audience

Shakespearean Fools and Clowns

Shakespearean Women

Supernatural Elements in Shakespearean Plays

Shakespearean Soliloquies

Shakespeare as a Sonneteer and a Narrative Poet

##### **Course Outcomes:**

- To understand the tragedies, comedies and tragic comedies of Shakespeare.
- Identify major literary characters in Shakespeare's work.
- Become familiar with the structure of a tragedy play/form.
- Increase their familiarity with Shakespearean language and expression.
- Develop sufficient ability for reading and understanding Elizabethan English to allow for better comprehension of Shakespeare's plays

## 16ACCEN9: SHAKESPEARE

### MAPPING

CO-PO-PSO matrix of course

1.Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	-	3	2	2	2	2	3
CO	3	3	-	3	2	2	2	2	3
CO	2	2	-	3	2	3	2	3	2
CO	2	2	-	2	3	2	2	2	3
CO	2	2	-	3	2	2	2	3	2
Average	2.4	2.2	-	2.8	2.2	2.2	2	2.4	2.6

## **CORE COURSE X**

### **16ACCEN10: PRINCIPLES OF LITERARY CRITICISM**

#### **Unit – I**

Literary Theory – Literary History – Literary Criticism

#### **Unit – II**

Classical Criticism:

Plato – Aristotle – Horace – Quintilian – Longinus

#### **Unit – III**

Orientation of Critical Theories:

Mimetic Theories – Pragmatic Theories – Sidney – Dryden – Dr. Johnson – Coleridge – Arnold – T. S. Eliot

#### **Unit – IV**

Five Approaches:

Moralistic Approach

Psychological Approach

#### **Unit – V**

Archetypal Approach

Sociological Approach

Formalistic Approach

#### **Course Outcomes:**

- Enriches students' understanding of the literary work.
- Helps to make value judgments on a work, to explain his or her interpretation of the work, or to provide others with relevant historical or biographical information.
- Acquire the knowledge of history of literary criticism, its various trends and schools.
- Learn to apply literary theory and approaches to texts whatever they read in order to enrich their understanding and appreciation of Literature.
- Ingrains the mind towards creative writing, appreciation, critical thinking and critical analysis.

## 16ACCEN10 – PRINCIPLES OF LITERARY CRITICISM (V SEM)

### MAPPING

CO-PO-PSO matrix of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

If there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	3	2	3	2	2	3	3	3
CO	3	3	2	2	3	3	3	2	3
CO	2	2	3	3	2	3	2	3	2
CO	3	3	3	2	3	2	3	2	3
CO	3	2	2	3	3	2	2	3	3
Average	2.8	2.6	2.4	2.6	2.6	2.4	2.6	2.6	2.8

**CORE COURSE XI**  
**16ACCEN11: AMERICAN LITERATURE**

**Unit – I: Poetry**

Walt Whitman : “I Hear America Singing”

Emily Dickinson : “A Bird Came Down the Walk”

**Unit – II: Poetry**

Robert Frost : “Mending Wall”

Sylvia Plath : “Lady Lazarus”

**Unit – III: Prose**

Martin Luther King : “I Have a Dream”

Ralph Waldo Emerson : “The American Scholar”

**Unit– IV: Drama**

Arthur Miller : Death of a Salesman

**Unit– V: Fiction**

Nathaniel Hawthorne : The Scarlet Letter

**Course Outcomes:**

- Identify relationships between moments in American history, colonialism, and culture.
- Instills the background of civil war and transcendentalism.
- Emphasizes on the meaning and the significance of American Dream, then and now.
- Aids to comprehend the effects of racism.
- Evaluate the thoughts, beliefs, customs, struggles, and visions of African American writers

## 16ACCEN11 - AMERICAN LITERATURE (V SEM)

### MAPPING

CO-PO-PSO matrix of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

If there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO 3	PO 4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	3	2	3	2	2	3	3	3
CO	3	3	2	2	3	3	3	2	3
CO	2	2	3	3	2	3	2	3	2
CO	3	3	3	2	3	2	3	2	3
CO	2	2	2	3	2	2	2	3	3
Average	2.6	2.6	2.4	2.6	2.4	2.4	2.6	2.6	2.8



**CORE COURSE XII**  
**16ACCEN12: INDIAN CULTURE AND LITERATURE**

**Unit – I: Poetry**

Kalidasa : “Look to This Day”

K.J. Saunders : “Karma” (Selection from Buddhist Verse)

**Unit – II: Poetry**

Dr.T. N. Ramachandran : “Tiruyirattaimanimaalai” (Selection from Translation on Kaaraikkaal Ammaiyaar)

Prof.K. G. Seshadri : “Fear We Not” (Selection from Translation on Bharathi)

**Unit – III: Prose**

S. Radhakrishnan : “Character Is Destiny”

M.K. Gandhi : “Faith on Its Trial”

**Unit – IV: Drama**

T.P. Kailasam : “The Burden”

D.G. Mukerji : “The Judgment of Indra”

**Unit – V: Fiction**

Indira Goswami : “The Journey”

Bama : Karukku

**Course Outcomes:**

- Appreciate the historical trajectory of various genres of Indian Writing in English from colonial times to till the present.
- Gain insight into “Indianness” through respective works.
- Analyse literary texts and recognize the limitations, especially due to the challenges by reading non-western texts in a predominantly western academic setting and they learn a wide range of Indian culture.
- Apply the ideas encapsulated in Indian Aesthetics to literary texts
- Understand the special emphasis on the issues such as the representation of culture, identity, history, national and gender politics.

## 16ACCEN12: INDIAN CULTURE AND LITERATURE

### MAPPING

CO-PO-PSO matrix of course

1.Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	2	2	2	3	2	2	3	2	3
CO	2	3	2	3	3	2	3	2	2
CO	2	2	3	2	2	3	3	2	2
CO	2	2	3	2	3	2	2	2	2
CO	2	2	2	3	2	2	2	3	3
Average	2	2.2	2.4	2.6	2.4	2.2	2.6	2.2	2.4

## **Major Based Elective I**

### **16AMBEEN1:TRANSLATION: THEORY AND PRACTICE**

#### **Unit – I**

Translation – Definition, Types, Principles – Decoding and Recoding – Problems of Equivalence – Untranslatability

#### **Unit – II**

History of Translation Theory – Period Study – The Romans – Bible Translation – Early Theorists – The Renaissance – 17th Century and 18th Century – Romanticism – Victorians – 20th Century

#### **Unit – III**

Problems of Literary Translation – Structures – Translating Poetry – Translating Prose – Translating Dramatic Texts

#### **Unit– IV**

Two chapters from G.U Pope’s Translation of Tirukkural:

“The Utterance of Pleasant Words”

“Not Doing Evil”

#### **Unit – V**

Translation Practice: Translating Proverbs and Prose from English to Tamil and vice versa

#### **Course Outcomes:**

- Introduces theoretical concepts relevant to practical translation. It creates a basic understanding of the theories underpinning the practice of translation
- Creates the awareness of different types of texts (written and oral) approaches and strategies for translating.
- Examine key linguistic and cultural aspects of translating; knowledge and understanding of the types of difficulties encountered when translating.
- Inculcate self - confidence and self-awareness to do independent study.
- Develop awareness of linguistic and cultural contrasts between language

## 16AMBEEN1: TRANSLATION: THEORY AND PRACTICE

### MAPPING

CO-PO-PSO matrix of course

1.Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	3	3	2	2	3	2	3
CO	3	3	2	3	3	2	3	2	3
CO	2	3	3	2	2	3	2	3	2
CO	2	2	3	2	3	2	2	2	2
CO	2	2	2	3	2	3	2	3	3
Average	2.4	2.4	2.6	2.6	2.4	2.4	2.4	2.4	2.6

**UG DEPARTMENT OF ENGLISH**  
**SHRIMATI INDIRA GANDHI COLLEGE**  
**(Nationally Accredited at A Grade (3rd Cycle) by NAAC)**  
**(Affiliated to Bharathidasan University)**  
**Tiruchirappalli 620 002**

**Programme Outcomes in Arts (UG) (PO)**

- PO1: Understand LSRW and apply knowledge of human communication and language processes.
- PO2: Prepare culture and praise worthy as a citizen of India.
- PO3: Examine employment / entrepreneurship opportunities.
- PO4: Understand the fundamental values /principles of Indian consciousness.
- PO5: Ability to use communication and soft skills effectively.

**B.A., English Programme Specific Outcome (PSO)**

- PSO1: The basic aim in pursuing B.A. English Literature is to think creatively and analytically about the English language in its varied forms.
- PSO2: This requires critical Listening, Speaking, Reading and Writing as an effective basis of literary inquiry in association with literary contexts. These skills include clear expression and sound mechanics that can be practiced through creative writing, research and critical argument.
- PSO3: It also employs understanding of literature as a basis of literary inquiry. These contexts include: the influences of culture, race and gender -genre, literary traditions and historical periods: literary production and the insights of literary theories.

PSO4: All the above outcomes are developed through class discussion including film, visual media and performance.

PSO5: An English language-focused degree will train students to analyse the working of the English language outside literature, including language-based communication in all kinds of forms and contexts.

PSO6: B.A. English degree can lead to a wide range of careers. The graduates can work in areas such as professional writing, publishing, teaching, IT, law (by conversion course), education policy, event management, leisure and tourism management, marketing and journalism.

**SEMESTER:2**

**CORE COURSE III**  
**16ACCEN3: POETRY I**

**Unit – I**

Edmund Spenser : Amoretti LXXV – “One Day I Wrote Her Name”

William Shakespeare : Sonnet 18

**Unit– II**

John Donne : “Go and Catch the Falling Star”

Andrew Marvel : “A Dialogue between the Soul and Body”

**Unit – III**

John Milton : “Lycidas”

**Unit– IV**

John Dryden : “A Song of St. Cecilia’s Day”

Alexander Pope : “Ode on Solitude”

**Unit – V**

Oliver Goldsmith : “The Village Preacher”

William Blake : “The Lamp”

**Course Outcome:**

- Make learners sharpen their poetic sensibility and stylistic skills.
- Provide a comprehensive guide to English poetry, its development, its forms and movements, throughout the ages.
- Recognize poetry from a variety of cultures, languages and historic periods.
- Understand and appreciate poetry as a literary art.
- Analyse the various elements of poetry, such as diction, tone, form, genre, imagery, figures of speech, symbolism, theme, etc.

## 16ACCEN3 – POETRY I

### MAPPING

CO-PO-PSO matrix of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

If there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	3	2	2	3	2	3
CO	3	3	2	2	3	3	3	2	3
CO	3	2	2	3	2	3	2	3	2
CO	2	2	3	2	3	2	3	2	3
CO	2	3	3	3	2	2	2	3	2
Average	2.6	2.4	2.4	2.6	2.4	2.4	2.6	2.4	2.6



**CORE COURSE IV**  
**16ACCEN4: FICTION**

**Unit – I**

Charles Dickens : David Copperfield

**Unit– II**

R.L. Stevenson : Treasure Island

**Unit– III**

Joseph Conrad : Heart of Darkness

**Unit – IV**

Virginia Woolf : To the Light House

**Unit – V**

Aldous Huxley : Brave New World

**Course Outcome:**

- Develop the ability and interest to read literary prose and fiction on their own.
- Understand how society and culture played a significant role in the lives and career of the writers of the age.
- Analyse and appreciate the narrative styles of the writers and the innovative novelistic techniques employed by them.
- Exposed to different cultures, myths and histories of various nation through fiction.
- Receive creative acumen and will be nourished by the scintillating stories and a sense of inclination towards literary sensibility.

## 16ACCEN4: FICTION

### MAPPING

CO-PO-PSO matrice of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

if there is no Correlation, put ‘-‘

Po/Pso / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	2	2	2	2	2	2	3	2	3
CO	3	3	2	2	2	2	2	2	2
CO	2	2	2	3	2	3	3	3	2
CO	2	2	3	2	3	2	2	2	3
CO	2	2	2	3	3	2	2	2	3
Average	2.2	2.2	2.2	2.4	2.4	2.2	2.4	2.2	2.6

**ALLIED COURSE II**  
**16AACEN2: LITERARY FORMS**

**Unit– I: Poetry**

Ballad – Epic and Mock Epic – Dramatic Monologue –Limerick – Lyric – Ode – Elegy –  
Pastoral Elegy – Sonnet

**Unit– II: Poetry**

Rhyme – Metre – Stanza Form – Types of Verse – Figures of Speech  
Imagery – Simile and Metaphor – Personification – Onomatopoeia – Alliteration – Apostrophe –  
Hyperbole – Oxymoron – Allegory – Allusion – Irony and Metonymy

**Unit – III: Drama**

The Origin and Growth of Drama in England – Tragedy and Comedy – Dramatic Design –  
Romantic Tragedy and Romantic Comedy – Tragicomedy – Chronicle Plays – Masque and  
Antimasque – Comedy of Humours – Comedy of Manners – Genteel Comedy – Sentimental  
Comedy – Farce – Melodrama – Expressionist Drama – Absurd Drama – One-Act Play

**Unit– IV: Non-Fiction**

Biography – Autobiography – Essay – Aphoristic, Personal, Critical, Periodical

**Unit – V: Fiction**

Short Story – Picaresque Novel – Historical, Sentimental and Gothic Novel – Science Fiction –  
Detective – Social and Proletarian – Stream-of-Consciousness Novel

**Course Outcome:**

- Understand the origin and development of the different genres of literature.
- Identify the unique features of each literary form by way of comprehending its characteristics and conventions.
- Apply knowledge of the various forms of literature to the study of individual works.
- Achieve a bird's eye view to the nuances of English Literature, thereby strengthening expertise in literature students that amounts to their intertextualizing content and form of works of art.
- Analyse the evolution of English Literature and the evolution of its popular genres in terms of politics, culture, social and literary backgrounds.

## 16AACEN2: LITERARY FORMS MAPPING

CO-PO-PSO matrix of course

2. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	2	3	3	-	2	3	2	3	3
CO	2	3	2	-	2	2	2	3	3
CO	2	3	2	-	2	3	2	3	2
CO	2	2	3	-	2	2	2	2	3
CO	2	2	2	-	2	3	2	3	2
Average	2	2.8	2.8	-	2	2.6	2	2.8	2.6

## 20CEL2: Communicative English -II

### Unit I

1. Listening and Speaking
  - a. Listening and responding to complaints (formal situation)
  - b. Listening to problems and offering solutions (informal)
2. Reading and writing
  - a. Reading aloud (brief motivational anecdotes)
  - b. Writing a paragraph on a proverbial expression/motivational idea.
3. Word Power/Vocabulary
  - a. Synonyms & Antonyms
4. Grammar in Context
  - AdverbsPrepositions

### Unit II

1. Listening and Speaking
  - a. Listening to famous speeches and poems
  - b. Making short speeches- Formal: welcome speech and vote of thanks.  
Informal occasions- Farewell party, graduation speech
2. Reading and Writing
  - a. Writing opinion pieces (could be on travel, food, film / book reviews or on any contemporary topic)
  - b. Reading poetry

b.i. Reading aloud: (Intonation and Voice Modulation)

b.ii. Identifying and using figures of speech - simile, metaphor, personification etc.

3. Word Power

a. Idioms & Phrases

4. Grammar in Context

Conjunctions and Interjections

### **Unit III**

1. Listening and Speaking

a. Listening to Ted talks

b. Making short presentations – Formal presentation with PPT, analytical presentation of graphs and reports of multiple kinds

c. Interactions during and after the presentations

2. Reading and writing

a. Writing emails of complaint

b. Reading aloud famous speeches

3. Word Power

a. One Word Substitution

4. Grammar in Context: Sentence Patterns

### **Unit IV**

1. Listening and Speaking

a. Participating in a meeting: face to face and online

b. Listening with courtesy and adding ideas and giving opinions during the meeting and making concluding remarks.

2. Reading and Writing

- a. Reading visual texts – advertisements
- b. Writing a Brochure
3. Word Power
  - a. Denotation and Connotation
4. Grammar in Context: Sentence Types

## **Unit V**

1. Listening and Speaking
  - a. Informal interview for feature writing
  - b. Listening and responding to questions at a formal interview
2. Reading and Writing
  - a. Writing letters of application
  - b. Readers' Theatre (Script Reading)
  - c. Dramatizing everyday situations/social issues through skits. (writing scripts and performing)
3. Word Power
  - a. Collocation
4. Grammar in Context: Working With Clauses

## **Course Outcome:**

- Train learners to improve their poetic skills.
- Students are able to appreciate the rhyme, rhythm and the style of the poem.
- They can understand the thought and imagination contained in the poem.



## 20CEL2- COMMUNICATIVE ENGLISH 2

### MAPPING

CO-PO-PSO matrix of course

1.Slight(Low) 2.Moderate(Medium) 3.Substantial(High)

If there is no correlation,put -

Po/psO/ co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	-	2	2	3	2	3
CO	3	3	2	-	2	2	3	2	3
CO	2	2	-	-	2	-	-	3	2
CO	2	2	3	-	-	2	-	2	3
CO	2	2	2	-	-	2	2	-	-
Average	2.4	2.2	1.8	-	1.2	1.6	1.6	1.8	2.1

## **20PELLS2: Professional English for Life Sciences-II**

### **Unit 1- Communicative Competence**

Listening – Listening to two talks/lectures by specialists on selected subject specific topics -(TED Talks) and answering comprehension exercises(inferential questions) Speaking: Small group discussions (the discussions could be based on the listening and reading passages- open ended questions Reading: Two subject-based reading texts followed by comprehension activities/exercises Writing: Summary writing based on the reading passages.

**Unit 2 - Persuasive Communication** Listening: listening to a product launch- sensitizing learners to the nuances of persuasive communication

Speaking: debates – Just-A Minute Activities

Reading: reading texts on advertisements ( on products relevant to the subject areas) and answering inferential questions

Writing: dialogue writing- writing an argumentative /persuasive essay.

### **Unit 3- Digital Competence**

Listening to interviews (subject related)

Speaking: Interviews with subject specialists (using video conferencing skills)

Creating Vlogs (How to become a vlogger and use vlogging to nurture interests – subject related)

Reading: Selected sample of Web Page (subject area)

Writing: Creating Web Pages

Reading Comprehension: Essay on Digital Competence for Academic and Professional Life.

The essay will address all aspects of digital competence in relation to MS Office and how they can be utilized in relation to work in the subject area

### **Unit 4 - Creativity and Imagination**

Listening to short (2 to 5 minutes) academic videos (prepared by EMRC/ other MOOC videos on Indian academic sites – E.g. <https://www.youtube.com/watch?v=tpvicScuDy0>)

Speaking: Making oral presentations through short films – subject based

Reading : Essay on Creativity and Imagination (subject based)

Writing – Basic Script Writing for short films (subject based) - Creating blogs, flyers and brochures (subject based) - Poster making – writing slogans/captions (subject based)

### **Unit 5- Workplace Communication & Basics of Academic Writing**

Speaking: Short academic presentation using PowerPoint

Reading & Writing: Product Profiles, Circulars, Minutes of Meeting.

Writing an introduction, paraphrasing Punctuation (period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis) Capitalization (use of upper case)

#### **Course Outcome:**

- Attend interviews with boldness and confidence.
- Adapt easily into the workplace context, having become
- communicatively competent.
- Apply to the Research & Development organisations/ sections in
- companies and offices with winning proposals.

**20PELLS II - PROFESSIONAL ENGLISH FOR LIFE SCIENCES II**  
**(II SEM)**

**MAPPING**

CO-PO-PSO matrix of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
 if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
co	3	2	3	3	3	3	3	2	3
co	3	3	2	2	3	2	3	3	3
co	2	2	2	3	2	3	2	3	2
co	3	3	3	3	3	2	3	2	3
co	3	2	3	3	3	3	3	3	2
Average	2.8	2.4	2.6	2.6	2.4	2.8	2.8	2.6	2.6

## **20PELPS2: Professional English for Physical Science**

### **Semester-II**

#### **Unit 1- Communicative Competence (18 hrs)**

Listening – Listening to two talks/lectures by specialists on selected subject specific topics  
-(TED Talks) and answering comprehension exercises (inferential questions)

Speaking: Small group discussions (the discussions could be based on the listening and reading passages- open ended questions

Reading: Two subject-based reading texts followed by comprehension activities/exercises

Writing: Summary writing based on the reading passages. Grammar and vocabulary exercises/tasks to be designed based on the discourse patterns of the listening and reading texts in the book. This is applicable for all the units.

#### **Unit 2 - Persuasive Communication (18 hrs)**

Listening: listening to a product launch- sensitizing learners to the nuances of persuasive communication

Speaking: debates – Just-A Minute Activities

Reading: reading texts on advertisements (on products relevant to the subject areas) and answering inferential questions

Writing: dialogue writing- writing an argumentative /persuasive essay.

#### **Unit 3- Digital Competence (18 hrs)**

Listening to interviews (subject related)

Speaking: Interviews with subject specialists (using video conferencing skills) Creating Vlogs (How to become a vlogger and use vlogging to nurture interests – subject related)

Reading: Selected sample of Web Page (subject area)

Writing: Creating Web Pages

Reading Comprehension: Essay on Digital Competence for Academic and Professional Life. The essay will address all aspects of digital competence in relation to MS

Office and how they can be utilized in relation to work in the subject area

#### **Unit 4 - Creativity and Imagination (18 hrs)**

Listening to short (2 to 5 minutes) academic videos (prepared by EMRC/ other MOOC videos on Indian academic sites – E.g. <https://www.youtube.com/watch?v=tpvicScuDy0>)

Speaking: Making oral presentations through short films – subject based

Reading: Essay on Creativity and Imagination (subject based)

Writing – Basic Script Writing for short films (subject based)

- Creating blogs, flyers and brochures (subject based)

- Poster making – writing slogans/captions(subject based)

#### **Unit 5- Workplace Communication& Basics of Academic Writing (18 hrs)**

Speaking: Short academic presentation using PowerPoint

Reading & Writing: Product Profiles, Circulars, Minutes of Meeting.

Writing an introduction, paraphrasing Punctuation(period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis)

Capitalization (use of upper case)

#### **Course Outcome:**

- Attend interviews with boldness and confidence.
- Adapt easily into the workplace context, having become communicatively competent.
- Apply to the Research &Development organisations/ sections in companies and offices with winning proposals.

**20PELPS II - PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES II  
(II SEM)**

**MAPPING**

CO-PO-PSO matrix of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
co	3	2	3	3	3	3	3	2	3
co	3	3	2	2	2	2	3	3	3
co	2	3	2	3	2	3	2	3	2
co	2	3	3	3	3	2	3	2	3
co	3	3	2	3	2	3	2	3	3
Average	2.6	2.8	2.4	2.8	2.4	2.6	2.6	2.6	2.8

## **20PELAS2: Professional Communication Course for Arts and Science Colleges**

### **Unit 1- Communicative Competence**

Listening – Listening to two talks/lectures by specialists on selected subject specific topics  
-(TED Talks) and answering comprehension exercises (inferential questions)

Speaking: Small group discussions (the discussions could be based on the listening and reading passages- open ended questions

Reading: Two subject-based reading texts followed by comprehension activities/exercises

Writing: Summary writing based on the reading passages. Grammar and vocabulary exercises/tasks to be designed based on the discourse patterns of the listening and reading texts in the book. This is applicable for all the units.

### **Unit 2 - Persuasive Communication**

Listening: listening to a product launch- sensitizing learners to the nuances of persuasive communication

Speaking: debates – Just-A Minute Activities

Reading: reading texts on advertisements ( on products relevant to the subject areas) and answering inferential questions

Writing: dialogue writing- writing an argumentative /persuasive essay.

### **Unit 3- Digital Competence**

Listening to interviews (subject related)

Speaking: Interviews with subject specialists (using video conferencing skills) Creating Vlogs  
(How to become a vlogger and use vlogging to nurture interests – subject related)

Reading: Selected sample of Web Page (subject area)

Writing: Creating Web Pages

Reading Comprehension: Essay on Digital Competence for Academic and Professional Life.

The essay will address all aspects of digital competence in relation to MS Office and how they can be utilized in relation to work in the subject area



#### **Unit 4 - Creativity and Imagination**

Listening to short (2 to 5 minutes) academic videos (prepared by EMRC/ other MOOC videos on Indian academic sites – E.g. <https://www.youtube.com/watch?v=tpvicScuDy0>)

Speaking: Making oral presentations through short films – subject based

Reading: Essay on Creativity and Imagination (subject based)

Writing – Basic Script Writing for short films (subject based)

- Creating webpages, blogs, flyers and brochures (subject based)

- Poster making – writing slogans/captions(subject based)

#### **Unit 5- Workplace Communication& Basics of Academic Writing**

Speaking: Short academic presentation using PowerPoint

Reading & Writing: Product Profiles, Circulars, Minutes of Meeting.

Writing an introduction, paraphrasing Punctuation(period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis) Capitalization (use of upper case)

#### **Course Outcome:**

- Attend interviews with boldness and confidence.
- Adapt easily into the workplace context, having become communicatively competent.
- Apply to the Research & Development organisations/ sections in companies and offices with winning proposals.

**20PELAS II - PROFESSIONAL ENGLISH FOR ARTS & SOCIAL  
SCIENCES II**

**(II SEM)**

**MAPPING**

CO-PO-PSO matrice of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	3	3	3	3	3	2	3
CO	3	2	2	2	3	2	3	3	3
CO	2	3	3	3	2	3	2	3	2
CO	3	2	3	3	3	2	3	2	3
CO	3	3	2	3	2	3	3	3	2
Average	2.8	2.4	2.6	2.8	2.6	2.6	2.8	2.6	2.6

# **20PELCM 1: PROFESSIONAL ENGLISH FOR COMMERCE AND MANAGEMENT-I**

## **UNIT 1: COMMUNICATION**

1. Listening: Listening to instructions
2. Speaking: Telephone etiquette and Official phone conversations
3. Reading short passages (3 passages selected from Commerce and Management)
5. Writing: Letters and Emails in professional context
6. Grammar in Context:
  - Wh and yes or no,
  - Q tags
  - Imperatives
- 7, Vocabulary in Context: Word formation - .
  - i) Creating antonyms using Prefixes
  - ii) Intensifying prefixes (E. g inflammable)  
Changing words using suffixes
    - A) Noun Endings
    - B) Adjective Endings
    - C) Verb Endings

## **UNIT 2: DESCRIPTION**

Listening – Listening to process description

Speaking - Role play

Formal: With faculty and mentors in academic environment, workplace communication

Informal: With peers in academic environment, workplace communication Reading

–Reading passages on trade/commerce/management

Writing – Writing sentence definitions (e.g. ledger ) and extended definitions (e.g. accountancy)

Picture Description – Description of fashion and beauty products (a small write-up promoting the product/an objective review of the product in 150 to 200 words). Grammar in Context: Connectives and linkers.

Vocabulary – Synonyms (register) - Compare & contrast expressions.

### **UNIT 3: NEGOTIATION STRATEGIES**

Listening - Listening to interviews of specialists / inventors in fields (Subject specific)

Speaking – Brainstorming. (mind mapping). Small group discussions (subject specific)

Reading – Longer Reading text. (Comprehensive passages)

Writing – Essay Writing (250 word essay on topics related to subject area, like recording business trans)

Grammar in Context: Active voice & Passive voice – If conditional – Vocabulary: - Collocations

–Phrasal verbs

### **UNIT 4: PRESENTATION SKILLS**

Listening - Listening to presentation. Listening to lectures. Watching – documentaries (discovery / history channel)

Speaking –Short speech - Making formal presentations (PPT)

Reading – Reading a written speech by eminent personalities in the relevant field /Short poems / Short biography.

Writing - Writing Recommendations

Interpreting visuals - charts / tables/flow diagrams/charts

Grammar in Context – Modals

Vocabulary (register) - Single word substitution

## **UNIT 5: CRITICAL THINKING SKILLS**

Listening - Listening to advertisements/news and brief documentary films (with subtitles)

Speaking – Simple problems and suggesting solutions.

Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills (subject-specific)

Writing Studying problem and finding solutions- (Essay in 200 words)

Grammar-Make simple sentences

Vocabulary -Fixed expressions

### **Course Outcome:**

- Recognise their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar

**20PELCM II - PROFESSIONAL ENGLISH FOR COMMERCE &  
MANAGEMENT II**

**(II SEM)**

**MAPPING**

CO-PO-PSO matrix of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	3	3	3	3	3	2	3
CO	3	3	2	2	3	2	3	3	3
CO	2	2	2	3	2	3	2	3	2
CO	2	3	3	3	2	2	3	2	3
CO	3	2	3	3	3	3	3	2	2
Average	2.6	2.4	2.6	2.8	2.6	2.6	2.8	2.4	2.6

**SEMESTER:4**

**CORE COURSE VII**

**16ACCEN7: DRAMA**

**Unit – I**

Christopher Marlowe : Dr. Faustus

**Unit – II**

Ben Jonson : The Alchemist

**Unit – III**

Oliver Goldsmith : She Stoops to Conquer

**Unit– IV**

G. B Shaw : Pygmalion

**Unit – V**

Samuel Beckett : Waiting for Godot

**Course Outcome:**

- Understand the evolution of drama from Elizabethan theatre to post war theatre
- Analyse the socio-cultural background in their reading of the plays.
- To make learners comprehend and appreciate various cultures and varieties of its presentation in the representative texts.
- To expose learners to the sociological and psychological dimensions of characterization,
- The rhetorical aspect of drama will help them understand how to represent their experience and ideas critically, creatively, and persuasively through the medium of language

## 16ACCEN7 – DRAMA

### MAPPING

CO-PO-PSO matrix of course

1. Slight (Low) 2. Moderate (Medium) 3.Substantial (High)  
if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	3	3	2	3	3	3
CO	3	3	2	2	2	2	3	2	3
CO	2	2	3	3	3	3	2	3	2
CO	3	2	3	2	2	2	3	2	3
CO	2	3	2	3	3	3	2	2	2
Average	2.6	2.4	2.4	2.6	2.6	2.4	2.6	2.4	2.6



## **CORE COURSE VIII**

### **16ACCEN8: INTRODUCTION TO LANGUAGE AND LINGUISTICS**

#### **Unit – I**

The Origins and the Development of Language

#### **Unit – II**

The Organs of Speech – Classification of Speech Sounds

#### **Unit – III**

Phonology – Morphology

#### **Unit – IV**

Syntax – Semantics

#### **Unit – V**

Language, Society and Culture

#### **Textbook:**

Yule, George. The Study of Language: An Introduction. Cambridge: Cambridge UP, 1985.

#### **Course Outcome:**

- Classify ancient and traditional theories of language use in the society.
- Understand and describe the structure of the speech organs and their function and the basic methods of articulation.
- Analyse the acoustic property of speech sounds and classify the words based on morphological principles.
- Apply the concepts of various syntactic theories and differences among them and analyse how semantic and pragmatics interact and relate to neighbouring fields such as lexical theory and morphology and syntax.
- Evaluate the relationship between language and society

## 16ACCEN8: INTRODUCTION TO LANGUAGE AND LINGUISTICS

### MAPPING

CO-PO-PSO matrix of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	3	2	3	3	2	3
CO	3	3	2	3	2	2	3	2	3
CO	2	2	2	2	2	3	2	3	2
CO	2	2	3	2	2	2	3	2	2
CO	2	2	2	3	2	2	2	2	2
Average	2.4	2.2	2.2	2.6	2	2.4	2.6	2.2	2.4

## **AIILED COURSE IV**

### **16AACEN4: HISTORY OF ENGLISH LITERATURE II**

#### **Unit – I**

Chapters XIII & XIV : The Age of Pope

#### **Unit – II**

Chapters XV to XVII : The Age of Johnson

#### **Unit – III**

Chapters XVIII to XXI : The Age of Wordsworth

#### **Unit – IV**

Chapters XXII to XXIV : The Age of Tennyson

#### **Unit – V**

Chapters XXV & XXVI : The Age of Hardy and the Present Age

#### **Course Outcome:**

- Understand the growth and development of English Literature.
- Analyse various genre
- A strong understanding of the historical context of the writer

## 16AACEN4 – HISTORY OF ENGLISH LITERATURE – II

### MAPPING

CO-PO-PSO matrix of course

1.Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	3	2	2	3	2	3
CO	3	3	2	3	2	2	3	2	3
CO	2	2	2	3	2	3	3	3	2
CO	2	2	3	2	3	2	3	2	3
CO	2	2	2	3	2	2	2	3	3
Average	2.4	2.2	2.2	2.8	2.4	2.2	2.8	2.4	2.8

## **16ELCE4: Short Stories for Effective Communication**

### **Unit – I**

Rabindranath Tagore : The Auspicious Vision

Bhabani Bhattacharya : Glory at Twilight

### **Unit –II**

Oscar Wilde : The Nightingale and the Rose

John Galsworthy : Acme

### **Unit – III**

Isaac Bashevis Singer : The Son from America

Ray Bradbury : The Pedestrian

### **Unit – IV**

Anton Chekhov : A Nincompoop

Guy de Maupassant : The Diamond Necklace

### **Unit –V**

Katherine Mansfield : Sun and Moon

Saki : Fur

### **Course Outcome:**

They get an insight of different cultures and themes by reading short stories.

## 16ELCE4: Short Stories for Effective Communication

### MAPPING

CO-PO-PSO matrice of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	3	3	3	3	3	3	3
CO	3	3	2	2	2	2	3	2	3
CO	2	3	2	3	3	3	2	3	2
CO	3	2	3	3	2	2	3	2	3
CO	2	2	2	2	3	3	2	3	2
Average	2.6	2.8	2.8	2.6	2.6	2.6	2.6	2.6	2.6

## **SEMESTER 6**

### **CORE COURSE XIII**

#### **16ACCEN13: INDIAN WRITING IN ENGLISH**

##### **Unit– I: Poetry**

Henry Derozio : “The Harp of India”

Sarojini Naidu : “Love and Death”

##### **Unit– II: Poetry**

Nissim Ezekiel : “Poet, Lover, Birdwatcher”

A. K. Ramanujan : “Of Mothers, Among Other Things”

##### **Unit – III: Prose**

M. K. Gandhi : “Playing the English Gentleman” (Chapter 15 from The Story of My Experiments with Truth)

A. P. J. Abdul Kalam : “The Power of Prayer”

##### **Unit– IV: Drama**

Girish Karnad : Nagamandala

##### **Unit– V: Fiction**

Mulk Raj Anand : Coolie

##### **Course Outcome:**

- Introduces students to major movement’s figure of Indian Literature in English through the study of selected literary texts.
- Creates literary sensibility and emotional response to the literary texts, implants a sense of appreciation of that literature.
- Enables to appreciate the changing trends in Indian Literature in English from pre to post – Independence era.
- Gives an insight into some of the Indian writers in English is also introduced through some of the works.
- Develops a literary sensibility and display an emotional response to the literary texts and cultivate a sense of appreciation for them





**CORE COURSE XIV**  
**16ACCEN14:**  
**COMMONWEALTH LITERATURE**

**Unit – I: Poetry**

Sir Charles G.D Roberts : “The Solitary Woodsman”

Razia Khan : “My Daughter’s Boyfriend”

**Unit – II: Poetry**

Allen Curnow : “House and Land”

E.J Pratt : “The Dying Eagle”

**Unit – III: Prose**

Margaret Atwood : “Nature as a Monster” from Chapter 2 of Survival:

A Thematic Guide to Canadian Literature

**Unit – IV: Drama**

Wole Soyinka : The Road

**Unit – V: Fiction**

Chinua Achebe : Things Fall Apart

**Course Outcome:**

- Able to trace out the social and literary background of Commonwealth countries.
- Exposes the suppressed society reflected in the Commonwealth Literature.
- Identifies the geography of Commonwealth Literature and the issues of the commonwealth writers.
- Comprehends the major themes, literary trends and the problem of language in creative writing of the commonwealth writers.
- Analyses the relevance of reading these works in the light globalization

## 16 ACCEN14: COMMONWEALTH LITERATURE

### MAPPING

CO-PO-PSO matrix of course

1.Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	2	2	2	3	2	2	3	2	3
CO	3	2	2	2	2	2	3	2	2
CO	2	2	2	2	2	3	3	3	2
CO	2	2	3	2	2	2	2	2	3
CO	2	2	2	3	2	3	2	2	2
Average	2.2	2	2.2	2.4	2.2	2.4	2.6	2.2	2.4

**CORE COURSE XV**  
**16ACCEN15: ENGLISH LANGUAGE TEACHING**

**Unit – I**

Place of English in India – Issues Involved in the Teaching of English – English as Foreign Language, Second Language, and English for Specific Purposes

**Unit – II**

Approaches and Methods – Grammar Translation Method – Audio-lingual Method – Communicative Approach – Natural Approach – Content-based Instruction – Task-based Language Teaching

**Unit– III**

Teaching of Prose, Poetry, Drama, Grammar, Composition – Teaching LSRW Skills

**Unit – IV**

Testing – Types of Tests – Characteristics of a Good Test – Preparation of Model Exercises and Questions

**Unit – V**

Use of Audio-Visual Aids – Television and Language Lab in Teaching English

**Course Outcome:**

- Provides knowledge about how English was introduced in India and the role played in pre and post independent India.
- Focuses on in-depth knowledge various techniques, approaches and methods of language teaching. It inculcates an overview of communicative competence, linguistic competence and task-based learning.
- Helps to deal effectively with error analysis theory and the techniques of teaching grammar, poetry, prose, drama and vocabulary.
- Provides an in-depth analysis of LSRW and their sub-skills, and provides a platform to learn how to communicate effectively.
- Focuses on various types of testing and to evaluate the silent way, total physical, response, suggestopedia in language teaching. It provides the steps to design a standard test and also study the samples of competitive tests like TOEFL & IELTS

## 16ACCEN15 – ENGLISH LANGUAGE TEACHING

### MAPPING

CO-PO-PSO matrice of course

1.Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	3	2	2	2	2	3
CO	3	3	2	3	2	2	2	2	3
CO	2	2	2	3	2	3	2	3	2
CO	2	2	3	2	2	2	2	2	3
CO	2	2	2	3	2	2	2	3	3
Average	2.4	2.2	2.2	2.8	2	2.2	2	2.4	2.8

**Major-Based Elective II**  
**16AMBEEN2: JOURNALISM**

**Unit – I**

Definition of Journalism – Role of Journalism – Ethics – Press Laws – Press Council

**Unit–II**

News – Definition – Kinds – Elements – Source – News Agencies

**Unit– III**

Reporting – Qualities of Reporters – Beats – Kinds of Reporting with Special Reference to Court, Crime, Election, Sport – Investigative Reporting

**Unit – IV**

Editing – News Editor – Sub Editors – Anatomy of Editing.

**Unit – V**

Language of Journalism – Writing a News Story – Writing Opinion Pieces – Writing Leads – Headlines.

**Course Outcome:**

- Exposes the students to various aspects of journalism.
- Enables learners on how to provide public with the information they need.
- Provides various scopes to make the best possible decisions about the communities, the societies and the governments.
- Educates the learners as one of the best journalists.
- Makes the learner understand their responsibility and service to society. It also makes them understand the most important thing about journalism.

## 16 AMBEEN2: JOURNALISM

### MAPPING

CO-PO-PSO matrix of course

1.Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	2	2	2	3	2	2	3	2	3
CO	3	3	2	3	3	2	2	2	3
CO	2	2	3	3	2	3	3	3	2
CO	2	3	3	2	3	2	2	2	2
CO	2	2	2	3	2	3	2	2	2
Average	2.2	2.4	2.4	2.8	2.4	2.4	2.4	2.2	2.4

## **Major-Based Elective III**

### **16AMBEEN3: ENGLISH FOR COMPETITIVE EXAMINATIONS**

#### **Unit – I**

Basics in English Grammar and Usage: Articles, Prepositions, Tenses, Concord, Question Tag

#### **Unit – II**

Homophones – Homonyms – Phrases and Idioms – One-word Substitution – Reading Comprehension

#### **Unit – III**

Error Correction

#### **Unit – IV**

Letter Writing – Formal and Informal – Note-making

#### **Unit – V**

Expansion of Proverbs – Writing Essays

#### **Textbook:**

Pillai, Radhakrishna. G. English Grammar and Composition. Emerald Publishers, 2002.

#### **Course Outcome:**

- Evaluates a person of his knowledge or ability in competitive exams.
- Help students to get some vital information about those exams. To clear these exams dedicated efforts along with certain soft skills are required.
- Helps to gain the knowledge of both descriptive and objective English with sections on grammar, vocabulary, reading, writing and comprehension, this course guarantees improvement.
- Instill confidence in learners and improve their language skills to face the challenges of competitive examination.
- To equip learners with adequate English language skills to achieve success in competitive examinations.

## 16AMBEEN3 – ENGLISH FOR COMPETITIVE EXAMINATIONS

### MAPPING

CO-PO-PSO matrix of course

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High),  
if there is no Correlation, put ‘-‘

Po/Pso / co	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO	3	2	2	3	3	2	3	2	3
CO	3	3	2	2	2	2	3	2	3
CO	2	2	3	3	3	3	2	3	2
CO	3	2	3	3	3	2	3	2	3
CO	2	3	2	3	2	2	2	3	2
Average	2.6	2.2	2.2	2.8	2.6	2.2	2.6	2.4	2.6





# **SHRIMATI INDIRA GANDHI COLLEGE**

Nationally Accredited at 'A' Grade (3<sup>rd</sup> Cycle) by NAAC

An ISO 9001 : 2015 Certified Institution

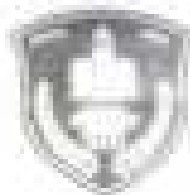
Tiruchirappalli - 620 002

**DEPARTMENT OF BUSINESS ADMINISTRATION**

**MAPPING PO AND CO**

**ODD SEMESTER**

**2022-2023**



# SHRIMATI INDIRA GANDHI COLLEGE

Nationally Accredited at A Grade (2<sup>nd</sup> Cycle) by NAAC

An ISO 9001:2015 Certified Institution

Trichy-620 002

## DEPARTMENT OF BUSINESS ADMINISTRATION

### ODD SEMESTER

#### PROGRAMME OUTCOMES (UG) (PO)

**PO1** Have a broad body of knowledge in business management concepts, current practices in a global business environment and emerging technologies to support, sustain and innovate business.

**PO2** Acquire problem solving, decision making and critical thinking skills to provide viable solutions for business problems.

**PO3** Appreciate diversity to communicate effectively in international and cross-cultural contexts, and facilitate collaborative professional and resolve ethical issues in business partnerships.

**PO4** Have the ability to work and collaborate as a team member and contribute to achieve team goals.

**PO5** Recognize, explain and illustrate the importance of ethical conduct and ethical issues in business.

#### PROGRAMME SPECIFIC OUTCOMES:

**PSO1** Acquire adequate knowledge through principles, theory and models of business management, accounting, marketing, finance and human resource.

**PSO2** Demonstrate proficiency for business communication for effective and professional business management.

**PSO3** Analyze and comprehend the applicability of management principles in solving complex business issues.

**PSO4** Develop entrepreneurial skills to become an entrepreneur.

**PSO5** Comprehend the applicability of management principles in the situations pertaining to global business world.

*Dr. Ananthi Jeyaraj*  
Signature of the Director

Director  
Department of Management Studies  
Shrimati Indira Gandhi College

Trichy-620 002

## Syllabus

### SEMESTER I: CORE COURSE-I INTRODUCTION TO MANAGEMENT

Course Code: ZHCCH4

Max. Marks: 100

Credit : 5

Hours/Week: 6

Internal Marks: 25

External Marks: 75

#### OBJECTIVES:

- To develop competencies and knowledge of students to become effective management professionals.
- To help them acquire the skills needed to become a successful manager.
- To impart knowledge on contemporary issues and challenges in the field of management.

#### UNIT-I:

Definition and Meaning of Management – Nature of Management – Distinction between Administration and Management – Importance of Management – Management as a science, art or profession – Levels of Management – Scope of Management – Functions of Management-RoleofaManager-ContributionsManagementthoughtbyF. W. Taylor and Henry Fayol.

#### UNIT-II:

Meaning-Nature-Importance-LimitationsofPlanning-StepstomakePlanning effective – Process of Planning – Methods of Planning – Objectives, Policies – Kind of Policies – Strategies – Types of Strategies, Procedures, Rules, Programmes, Budget – Meaning and Definition of Decision Making – Characteristics and Importance of Decision Making- Problems in Decision Making-Guidelines for effective DecisionMaking- Process of Decision Making – Types of Decisions – Techniques of Decision Making

#### UNIT-III:

Meaning – Importance and Process of Organization – Principles of Organization – Types of Organization – Line, Line and Staff Organization, Functional Organization, Committee Organization, Project Organization and Matrix Organization – Direction – Concept -Elements of Directing – Principles of Direction – Process of Directing.

#### UNIT-IV:

Delegation – Elements and Types of Delegation – Principles of Delegation – Obstacles to Delegation-Centralization-MeritsandDemerits-Decentralization-Merits and Demerits – DistinctionbetweenDelegationandDecentralization-CentralizationVsDecentralization.

#### **UNIT-V:**

Meaning – Nature and Importance of Control – Problems in Control – Process of Control – Techniques of Control – Co-ordination – Nature and Importance of Co-ordination – Problems in

Co-ordination – Principles of Co-ordination – Techniques of Co-ordination.

#### **UNIT-VI CURRENT CONTORS (For Continuous Internal Assessment only):**

Contemporary development related to – Expert Talk, Role Play, Group Discussion, Management Games and Webinar/Seminar

#### **COURSE OUTCOME**

On the successful completion of the course, student will be able to

- CO-1: Examine and explain the management evolution and how it will affect future managers.
- CO-2: Enhance their managerial abilities and professional skills.
- CO-3: Develop and make the students to know the organization hierarchy, authority and responsibility relationships associated with the different levels of Management.
- CO-4: Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.
- CO-5: Apply the knowledge about management in the real life business situation.

SEMESTER I: CORE COURSE-I INTRODUCTION TO MANAGEMENT (22BCCB81)

MAPPING

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	1	3	2	1	2	0
CO2	2	2	3	2	1	3	2	3	2	1
CO3	1	2	3	3	2	2	3	2	2	3
CO4	2	2	3	3	2	2	3	2	3	3
CO5	3	3	2	3	3	2	1	1	2	3
AVERAGE	1.8	2.1	2.8	2.6	1.8	2.4	2.2	2.2	2.3	3

  
Signature of the Director

Director  
Department of Management Studies  
Shri Chhatrapati Shivaji Maharaj Vastu Sangrahalaya  
Thakur N. P. W. College

**SEMESTER I: CORE COURSE - II**

**FUNDAMENTALS OF ACCOUNTING**

Course Code: 2201 / 1001

Max. Marks: 100

Unit: 5

Hours/Week : 6

Internal Marks : 25

External Marks : 75

**COURSE OBJECTIVES**

- To enable learners understand the fundamental concepts of Accounting
- To give them a basic knowledge of accounting principles
- Identify errors that need to be corrected in the accounting records

**UNIT I**

Definition of Account, Branches of Accounting, Accounting concepts and Principles - Double Entry Vs single entry - Books of Accounts

**UNIT II**

Journal, Ledger, Subsidiary Books, Trial Balance

**UNIT III**

Rectification of Errors, Adjusting, Kinds of Accounting Errors and Methods (Theory Only) - Bank Reconciliation Statement (BRS) - Final Accounts of Sole Trader - Trading, Profit and Loss Account and Balance Sheet with simple adjustments.

**UNIT IV**

Methods of Depreciation: Straight Line Method, Written Down Value Method and Annuity Method.

**UNIT V**

Capital and Revenue - Accounts of Non-trading organisations (Theory) and Expenditure Account - Receipts and Payments Account

(Theory 80% and Problems 20%)

**UNIT – VI – CURRENT CONTOURS (the Continuous Internal Assessment only):** Contemporary development related to assist students with the accounting concepts, tools and techniques influencing business organizations.

**COURSE OUTCOME:**

- CO1 Identify events that need to be recorded in the accounting records.
- CO2 Describe the need for adjustments while preparing the financial statements.
- CO3 To facilitate them to prepare final accounts of business and non-trading concerns.
- CO4 Recognize circumstances providing for increased exposure to errors and frauds.
- CO5 Along with the methods of depreciation, the accounts to be prepared by non-trading concerns.

SEMESTER I, CYBE COURSE-II FUNDAMENTALS OF ACCOUNTING (22HC082)

MAPPING:

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	2	3	2	1	2	-
CO2	1	2	3	3	2	3	2	1	2	1
CO3	3	2	3	3	2	3	3	1	2	3
CO4	2	2	1	1	2	1	1	1	1	1
CO5	1	1	2	1	2	2	1	1	2	2
AVERAGE	1	2.2	2.8	2.8	1.8	3	2.2	1	2.2	2

*[Signature]*  
Signature of the Director

Director  
Department of Management Studies  
Shri Mataji Indira Gandhi College  
Truchtrappali - 570 901



## Syllabus

### SEMESTER I: FIRST ALLIED COURSE MANAGERIAL ECONOMICS

Course Code: 22BFACB01  
Max. Marks: 100  
Credit: 3

Hours/Week: 4  
Internal Marks: 25  
External Marks: 75

#### OBJECTIVES

- To understand the application of managerial economics in managerial decision making analysis.
- To stress the need and relevance of studying economical analysis at the postgraduate level.
- To identify the market structure and price determination at different market conditions.

#### UNIT-I:

Nature and scope of managerial economics-definition of economic-important concepts of Economics - relationship between micro, macro, managerial economics

#### UNIT-II:

Objectives of business firm - Profit Maximization - Social responsibilities-Demand analysis- Law of Demand- Elasticity of demand.

#### UNIT-III:

Production function- Factors of production- Law of diminishing returns and Law of variable proportions. Cost and Revenue Curves-Break-even-point(BEP) analysis.

#### UNIT-IV:

Market structure and prices-Pricing under Perfect Competition-Pricing under Monopoly- Price discrimination - Pricing under Monopolistic competition-Oligopoly.

#### UNIT-V:

Profit-Theories and concepts- Government and Business-Performance of public enterprises in India and pricing in public utilities.

## UNIT-V:

Profit-Theories and concepts: Government and Business-Performance of public enterprises in India and pricing in public utilities.

## UNIT-VI CURRENT CONTOURS (the Continuous Internal Assessment only):

Contemporary developments related to the course in setting firm's pricing strategies; Perceptual mapping of a firm's demand curve and market forces; To analyse the government's performance through the economic indicators.

## COURSE OUTCOMES:

- CO1 Apply the objectives of business firms, demand analysis and elasticity of demand.
- CO2 Identify the effective applications of factors of production.
- CO3 Analyse the break-even point in their business.
- CO4 Understand the determination of the price, market structure and competition.
- CO5 Evaluate the performance of public sector in India.

SEMESTER I ALLIED COURSE-I MANAGERIAL ECONOMICS (22BFAC01)

MAPPING

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO/PSO ID	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	2	3	2	1	2	-
CO2	3	3	3	2	2	3	2	1	2	1
CO3	3	2	3	2	2	3	3	1	2	3
CO4	2	2	3	2	2	3	3	1	3	3
CO5	3	3	3	2	2	3	1	1	2	3
AVERAGE	3	3	2.3	2	1.8	3	2.3	1	2.2	2



Signature of the Director

Director  
Department of Management Studies  
Srimati Indira Gandhi College  
Trichirappalli - 620 002.

## Syllabus

### SEMESTER III- CORE COURSE V MANAGERIAL COMMUNICATION

Course Code: Z2BCCRB5  
Max. Marks: 100  
Credit: 5

Hours/Week: 6  
Internal Marks: 25  
External Marks: 75

#### OBJECTIVES:

- To understand the techniques and skills of communication
- To define the principles of effective communication.
- To analyse the essentials of good report writing.

#### UNIT – I:

Communication: Definition, Objectives of communication, Characteristics of communication- Process of communication-Levels of communication, Communication flow-Purpose of communication-Overcoming the barriers of effective communication.

#### UNIT – II:

Written communication-Planning steps for effective writing - Principles - Writing business reports (Short & Long), Business letters -Kinds of business letters- Audience analysis, Writing positive, Neutral, Persuasive.

#### UNIT – III:

Verbal and Non verbal Communication- Listening-Meaning, Importance, Types of listening, Tips for effective listening.

#### UNIT – IV:

Recommendation letters - Thank you letters-Preparing job application Letter-Letter of appointments-Sales letter- Press releases, Proactive media writing and E-Mail-Internet, Mail merge in MS office.

#### UNIT – V:

Motion -Notice, Preparing agenda, and resolution & Minutes-Proposals-Resume writing-Reports and executive summaries.

## **UNIT-VI CURRENT CONTOURS (for Continuous Internal Assessment only):**

Contemporary developments related to the course charting the areas concerned. Pro-forma for performance appraisals, Captions for advertising, Company notice related issues/Dividends, Use of Google groups and Google sheets.

### **COURSE OUTCOMES:**

- CO1 The students will be aware of their communication skills and know their potential to become successful managers.
- CO2 The students will get enabled with the mechanics of writing and can compose the business letters in English precisely and effectively.
- CO3 Students will get Exposure in drafting business proposals to meet the challenges of competitive environment.
- CO4 The students will be introduced to the managerial communication practices in business those are in vogue.
- CO5 Students will get trained in the art of Interpersonal communication and technological advancement and social media usage in communication, with emphasis on analysing business situations.

**SEMESTER III: CORE COURSE-V: MANAGERIAL COMMUNICATION (22BC3005)**

**MAPPING**

**CO-PO-PSO Matrix of Course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	1	3	2	1	2	-
CO2	2	2	3	3	1	3	2	3	2	1
CO3	3	2	3	3	2	2	3	2	2	3
CO4	2	2	3	3	2	2	3	2	3	3
CO5	3	3	2	3	3	2	1	1	2	3
AVERAGE	2.6	2.2	2.8	2.8	1.8	2.4	2.2	2.2	2.2	2

  
Signature of the Director

Director  
Department of Management Studies  
Shri Sri Indira Gandhi College  
Tiruchappalli - 620 002

**Syllabus**  
**SEMESTER III- CORE COURSE VI**  
**COMPUTER APPLICATION IN BUSINESS**

Course Code: J2BCCH26  
Max. Marks: 100  
Credit: 5

Hours/Week: 6  
Internal Marks: 25  
External Marks: 75

**OBJECTIVES:**

- To enable students to understand the basic concepts in computer applications.
- To give in-depth knowledge of documentation through MS Office packages.
- To help them apply various accounting procedures through TALLY software.

**UNIT-I:**

Meaning of computer – Characteristics – components – Hardware and Software - operation system – Creations of files and folders, Windows explorer, Introduction to MS word - Short cut for MS word – Creating word documents – Business letters using wizards – Editing, inserting objects and formatting documents- Spelling and grammar check – Word count – Thesaurus – Auto correct – Working with tables – Saving, opening and closing documents – Mail merge.

**UNIT-II:**

Introduction to MS Excel and its features- Building worksheets – Entering data, editing and formatting worksheets – Creating and formatting different types of charts – Application of financial and statistical function – Organizing data using Automatic rule saving, opening and closing of work books, MS PowerPoint Creating a simple presentation – Creating, inserting and deleting slides – Saving a Presentation – Slide Show.

**UNIT-III:**

Fundamentals of computerized accounting – computerized accounting Vs manual accounts, Architecture and customization of TALLY – Features of Tally, Configuration of Tally screens and menus – Creation of company and groups – Editing and deleting ledgers- Introduction to vouchers- Entry, payment, receipt, sales, purchase, contract and Journal vouchers- Editing and deleting vouchers.

**UNIT-IV:**

Introduction to inventories – Creation of stock categories – Stock groups – Stock items – Configuration and features of stock items – Editing and deleting stocks- Day books- Trial balance – Profit and loss account – Balance sheet.

#### **UNIT-V:**

Introduction to GST - Setting up GST rates - creating GST Ledger - Purchase voucher with GST - Sales voucher with GST - GST Report and Returns.

#### **UNIT-VI (CURRENT CONTOURS (for Continuous Internal Assessment only))**

Practical: Collection Bills with GST - CGST - SGST - IGST

#### **COURSE OUTCOMES:**

- CO 1 Students gain the knowledge of computers.
- CO 2 Students developed skills in MS Office
- CO 3 They get acquaint skills in Tally for business functions.
- CO 4 Student known about the GST
- CO 5 Students gain the Practical Knowledge in MS Office, Tally and GST applications



SEMESTER III: CORE COURSE- VI COMPUTER APPLICATION IN BUSINESS  
(2020CBZ)  
MAPPING

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	1	3	2	1	2	-
CO2	2	2	3	2	1	3	2	3	2	1
CO3	3	2	3	3	2	2	3	2	2	3
CO4	3	2	3	3	2	2	3	2	3	3
CO5	3	3	2	3	3	2	1	1	2	3
AVERAGE	2.6	2.2	2.8	2.6	1.8	2.4	2.2	2.2	2.2	2

  
Signature of the Director

Director  
Department of Management Studies  
Sriemati Indira Gandhi College  
Truchirappalli - 620 802

Syllabus  
**SEMESTER III: SECOND ALLIED COURSE-I**  
**BUSINESS LAW**

Course Code: 22BSACBB1  
Max. Marks: 100  
Credit: 3

Hours/Week: 4  
Internal Marks: 25  
External Marks: 75

**UNIT-I:**

Contract Act-Definition, Classification-Essentials of a Contract-Offer and Acceptance- Consideration - Contractual Capacity - Free Consent - Legality of Object.

**UNIT-II:**

Performance of Contract- Modes of Discharge of Contract- Remedies for Breach of Contract.

**UNIT-III:**

Law of Agency - Mode of creation-Agency by Ratification-Sub-Agent and Substituted Agent- Termination of Agency.

**UNIT-IV:**

Sale of Goods Act-Definition - Conditions and Warranties-Transfer of Property- Performance of Contract of Sale - Rights of an Unpaid Seller.

**UNIT-V:**

Partnership - Definition - Essentials- Rights, duties and Liabilities of partners- Types of partnership - Dissolution of partnership.

## **UNIT VI – CURRENT CONTOURS (for Continuous Internal Assessment only)**

Course content shall be delivered in the light of relevant case laws through Expert Talk, Group Discussion, Role Play and Power-Point Presentation

### **COURSE OUTCOMES:**

- CO1 Learn the basics of laws governing commercial contracts and nuances of competency to contract, rules of consideration, free consent and object of contract with case laws and illustrations.
- CO2 Have an insight on the provisions related to Sale of Goods Act 1930
- CO3 Understand the consequences of applicability of various laws in business situations.
- CO4 Know the rights and duties under various legal acts.
- CO5 Develop critical thinking through the use of law cases.

**SEMESTER III- SECOND ALLIED COURSE-1 BUSINESS LAW (22BSACB11)**

Q/PSO ID	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
Q1	1	2	3	2	1	1	2	1	2	-
Q2	2	2	3	2	1	1	2	3	2	1
Q3	1	2	3	3	2	2	3	2	2	3
Q4	1	2	3	3	2	2	3	2	3	3
Q5	1	3	2	3	3	2	1	1	2	3
AVERAGE	2.6	2.2	2.8	2.6	1.8	2.4	2.2	2.2	2.2	2

  
Signature of the Director

**Director**  
Department of Management Studies  
Srimati Indira Gandhi College  
Tiruchirappalli - 620 002.

Syllabus  
**SEMESTER III : NON-MAJOR ELECTIVE COURSE-I**

**I. E-COMMERCE**

Course Code: ZIBNME01

Max. Marks: 100

Credit: 3

Hours/Week: 2

Internal Marks: 25

External Marks: 75

**COURSE OBJECTIVES:**

- To understand the conceptual foundations of marketing management as a functional area of business.
- Analyse the impact of E-commerce on business models and strategy.
- Explain the process that should be followed in building an e-commerce presence.

**UNIT-I:**

Introduction to E-Commerce – Electronic Commerce Framework – Electronic commerce and Media convergence – The anatomy of E-Commerce Applications – Components of the I Way – Network Access Equipment – Global Information Distribution Networks – Internet Terminology – NSF NET: Architecture and Components- National Research and Educational Network.

**UNIT-II:**

Electronic Commerce and World Wide Web: Architectural Framework for E-Commerce – WWW Architecture – Hypertext Publishing – Consumer Oriented Applications-Merchandise Process Models – Consumer's Perspective – Merchant's Perspective – Electronic Payment Systems (EPS) -Types- Designing EPS -Smart Cards and EPS – Credit Cards and EPS.

**UNIT-III:**

Electronic Data Interchange (EDI): Applications – Security and Privacy Issues-Software Implementations – Value Added Networks – Internal Information System – Work-Flow Automation and Coordination – Customization- Supply Chain Management.

**UNIT-IV:**

Marketing on the Internet: Advertising on the Internet – Charting the On-Line Marketing Process – E- Commerce Catalogs or Directories – Information Filtering – Consumer-Data Interface: Emerging Tools.

## **UNIT-V:**

Multimedia and Digital Video: Concepts - Digital Video and E-Commerce – Video Conferencing-Frame Relay- Cell Relay - Mobile Computing -Frame Work -Wireless Delivery Technology - Cellular Data Communication Protocols.

## **UNIT-VI CURRENT CONTOURS (for Continuous Internal Assessment Only)**

Contemporary Developments Related to the E-Commerce-Studying: Electronic data interchange, Security and Privacy Issues - Group Discussion ethical issues on E – Commerce.

### **COURSEOUTCOMES:**

- To identify core concepts of marketing and the role of marketing in business and society. Knowledge of social, legal, ethical and technological forces on marketing decision-making.
- Appreciation for the global nature of marketing and appropriate measures to operate effectively in international settings.
- Ability to develop marketing strategies based on product, price, place and promotion objectives.
- Ability to create an integrated marketing communications plan which includes promotional strategies and measures of effectiveness.
- Ability to communicate the unique marketing mixes and selling propositions for specific product offerings.

**SEMESTER III - NON-MAJOR ELECTIVE COURSE-IE-COMMERCE  
EDNMBEII**

**MAPPING**

**CO-PO-PSO Matrix of Course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	1	3	2	1	2	-
CO2	2	2	3	2	1	3	2	3	2	1
CO3	1	2	3	1	3	2	3	2	2	3
CO4	1	2	3	1	2	2	3	2	1	3
CO5	1	1	2	1	3	2	1	1	2	3
AVERAGE	1.4	2.2	2.8	1.4	1.8	1.4	2.1	2.2	2.2	2

*Dr. V. Srinivasan*  
Signature of the Director

Director  
Department of Management Studies  
Sri Mata Jyoti's Gandhi College  
Tiruchirappalli - 620 002.

**Syllabus**  
**SEMESTER III: NON-MAJOR ELECTIVE COURSE-I**  
**1. INVESTMENT MANAGEMENT**

Course Code: 22BNMEH12  
Max. Marks: 100  
Credit: 2

Hours/Week: 2  
Internal Marks: 25  
External Marks: 75

**COURSE OBJECTIVES:**

- To enable students to understand the nuances of stock market operations and understand the techniques involved in purchase or sale of securities.
- Develop the portfolio and make the investment decision.
- This course aims to help students develop a broad knowledge and understanding of portfolio management and investment analysis.

**UNIT-I:**

Financial and economic meaning of investment – Characteristics and objectives of investment – Types of investment – Investment Planning, Investment alternatives – Investment and speculation – Risk and return concepts.

**UNIT- II:**

Securities Market - Participants of the Securities Market – Primary Market – Role of primary market – Stock exchanges in India – BSE, GTCEI, NSE, MCX, and Regulations of stock exchanges – Trading system in stock exchanges – SEBI and its functions.

**UNIT- III:**

Economic Analysis – Economic factors – Industry Analysis: Industry classification, industry life cycle – Company Analysis: Measuring Earnings – Financial Analysis & Ratio Analysis – Forecasting the earnings model.

**UNIT- IV:**

Fundamental Analysis Vs Technical Analysis – Dow Theory, Charting methods – Market indicators, Trend patterns – Trend reversal Patterns – Moving Average – Exponential moving Average – Oscillators – Efficient Market theory.

**UNIT- V:**

Portfolio analysis – Portfolio Selection – Capital Asset Pricing Model – Portfolio Revision – Portfolio Evaluation – Mutual Funds.



## **UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Contemporary Developments- Related to the portfolio analysis - Practical mock online trading, Mock portfolio construction, Group Discussion, Role Play.

### **COURSE OUTCOMES:**

- CO1 Understand the various alternatives available for investment.
- CO2 Learn to measure risk and return.
- CO3 Gain knowledge of the various strategies, followed by investment practitioners.
- CO4 Understand the characteristics of different financial assets such as money market instruments, bonds, and stocks, and how to buy and sell these assets in financial markets.
- CO5 Critically discuss client objectives and the investment policy statement.

SEMESTER III : NON-MAJOR ELECTIVE COURSE-I  
 2. INVESTMENT MANAGEMENT  
 22HNMEH02

MAPPING:

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	1	3	2	1	3	-
CO2	2	2	3	2	1	3	2	3	2	1
CO3	3	2	3	3	2	2	3	2	2	3
CO4	2	2	3	3	2	2	3	2	3	3
CO5	3	3	2	3	3	2	1	1	2	3
AVERAGE	2.6	2.2	2.8	2.6	1.8	2.4	2.2	2.2	2.2	2



Signature of the Director

Director

Department of Management Studies

Shri Mata Jijee Gandhi College

Trichirappalli - 620 022

**Syllabus**  
**SEMESTER V: CORE COURSE- IX**  
**COST ACCOUNTING**

Course Code: 22BCCB08  
Max. Marks: 100  
Credit: 5

Hours/Week: 5  
Internal Marks: 25  
External Marks: 75

**COURSE OBJECTIVES:**

- To understand the basic concepts of cost accounting.
- To gain knowledge on principles and procedures of cost accounting and
- To apply the costing techniques in different practical situations.

**UNIT – I:**

Meaning and Scope of Cost Accounting – Concept and Classification of Cost Elements and Methods of Cost – Relationship of Cost Accounting and Financial Accounting – Preparation of Cost Sheet.

**UNIT – II:**

Materials – EOQ - Levels of Stock – Receipts and Issues of materials – LIFO Analysis - Stores Ledger – FIFO, LIFO, Simple Average and Weighted Average.

**UNIT – III:**

Labour – Time-Keeping and Time-Booking – Methods of Remuneration and Incentive Schemes – Overtime and Idle time – Labour Turnover – Causes, Types and Measurement.

**UNIT – IV:**

Overheads – Collection, Classification, Allocation, Apportionment and Absorption – Recovery Rates – Over and Under Absorption – Machine Hour Rate – Job Costing – Contract Costing.

**UNIT – V:**

Operating Costing – Process Costing: Normal Loss, Abnormal Loss and Abnormal Gain/excluding Equivalent Production and Inter-process).

(Marks: Theory 40% and Problems 60%)

### **UNIT-V CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Contemporary development related to apply the methods of costing adopted by different types of industries.

#### **COURSE OUTCOMES: -**

- Understanding the concept of cost accounting. Recognize the merits and demerits of cost accounting along with the elements of cost concepts.
- Describe the cost sheets for the purpose of stores control through economic order quantity pricing and material issues.
- Measure the cost in various types of costing followed by various organizations.
- Plan, design and execute practical activities using techniques and procedures appropriate to cost accounting.
- Respond to change within the external and internal business environments and its effect upon accounting.

**SEMESTER V: CORE COURSE- IX COST ACCOUNTING  
22BCCB08**

**MAPPING**

**CO-PO-PSO Matrix of Course:**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO\PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	2	3	2	1	2	-
CO2	3	2	3	2	2	3	2	1	2	1
CO3	3	2	3	3	2	2	3	1	2	3
CO4	3	2	3	3	2	2	3	1	3	3
CO5	3	1	2	3	2	2	1	1	2	3
AVERAGE	3	2.2	2.8	2.6	2	2.4	2.2	1	2.2	2

*(Signature)*  
Signature of the Director

Director  
Department of Management Studies  
Sri Mata Jyoti Basini College  
Trichirappalli - 620 002.

**Syllabus**  
**SEMESTER V: CORE COURSE- X**  
**FINANCIAL MANAGEMENT**

Course Code: 22HCCB09  
Max. Marks: 100  
Credit : 5

Hours/Week : 5  
Internal Marks: 25  
External Marks: 75

**COURSE OBJECTIVES:**

- To expose learners to various concepts and principles of financial management.
- To develop in them decision making skills on various financial matters.
- To acquaint them with various tools for the management and understanding of finance.

**UNIT – I:**

Financial Management – meaning and Scope – Finance functions – profit maximization and Wealth maximization – Sources of Finance – Short term – bank sources – Long term – Shares – Debentures, Preferred stock – debt.

**UNIT – II:**

Cost of Capital – Concepts, Importance – classification – Calculation of Cost of Debt, Cost of Equity and Cost of Preference Shares – Cost of Retained Earnings – Weighted Average Cost of Capital.

**UNIT – III:**

Leverages – Meaning and Significance – Types: Operating, Financial and Combined Leverages – EBIT and EPS Analysis, Dividend – Forms of Dividend – Factors determining dividend – Dividend Theories and Dividend Policies.

**UNIT – IV:**

Capital Structure Planning – Meaning and Scope – Approaches: Net Income Approach – Net Operating Income Approach – MM Approach – Arbitrage Process – Traditional Approach – Indifference Point.

**UNIT-V:**

Capital Budgeting (Investment Decisions) – Concept and Importance – Appraisal Methods: Pay Back Method – Discounted cash Flow method – NPV Method, Excess present value Index, IRR, ARR and ROI.

**(Marks: Theory 40% and Problem 60%.)**

### **UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

*Contemporary development related to understand the applications of development finance as practiced in finance institutions, economics finance clusters of governments and other development finance related institutions.*

### **COURSE OUTCOMES:**

- Demonstrate and understand the overall role and importance of Financial Functions.
- Demonstrate Basic Financial Management Knowledge.
- Communicates effectively using standard Business terminology.
- Utilize information to maximize and manage finance.
- Demonstrate a basic understanding of Budgeting.

SEMESTER V CORE COURSE- X FINANCIAL MANAGEMENT

ENCC008

MAPING

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2	1	1	1	1	2	1	2	1
CO2	2	2	1	1	1	1	2	1	2	1
CO3	1	2	1	1	2	2	1	2	2	1
CO4	2	2	1	1	2	2	1	2	1	1
CO5	1	1	2	1	1	2	1	1	2	1
AVERAGE	2.0	2.2	2.0	1	1.8	2.0	2.2	2.2	2.2	1



Signature of the Director

Department of Management Studies  
 Anna University, Chennai  
 600 025



## Syllabus

### SEMESTER V: CORE COURSE- X

#### COMPANY LAW AND PRACTICE

Course Code: 22CCCH10  
Int. Marks: 100  
Total : 5

Hours/Week : 5  
Internal Marks: 25  
External Marks: 75

#### COURSE OBJECTIVES:

- To understand the concept of company law, formation of company and other activities of the company.
- To know the procedure conducting meetings and role of directors.
- To understand the process of winding up and dissolution.

#### UNIT – I:

Define Company-Kinds of company - Characteristics of company - Company distinguished from partnership - Formation of company-Company secretary - Rights and liabilities of a secretary.

#### UNIT – II:

Incorporation of a company - Certificate of incorporation - Certificate of commencement of business - Memorandum of Association - Articles of Association - Incorporation.

#### UNIT – III:

Share capital - Kinds of share capital - Share holders - Rights and liabilities of shareholders - Prospectus - Contents of prospectus - Allotment of shares - Transfer of shares - Reissue of shares - Meaning of dividend - types of dividend - Meaning of debenture - types of debentures.

#### UNIT – IV:

Appointment of directors - duties and liabilities of directors - managerial remuneration - Meeting-types of meetings - Notice - Quorum - Minutes of meeting - Process - Agenda - Chairman of the meeting - Resolution - Types of resolution.

#### UNIT – V:

Winding up - Modes of winding up - Consequences of winding up - Grounds of compulsory winding up - Voluntary winding up - Duties of secretary in respect of each winding up - Dissolution-Types of dissolution - Difference between winding up and dissolution.

## UNIT 14: COMPANY ACT 1956 (IN THE PART OF BUSINESS, FINANCIAL ACCOUNTING)

- Companies Act, 1956 (Section 1-10)
- Memorandum of Association (MOA) - (Section 19)
- Articles of Association (AOA) - (Section 20)
- Prospectus - (Section 26)
- Public Issue of Shares - (Section 27)
- Issue of Shares - (Section 28)
- Issue of Debentures - (Section 29)
- Issue of Preference Shares - (Section 30)
- Issue of Shares by Public - (Section 31)
- Issue of Shares by Private - (Section 32)
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- Issue of Shares by Private - (Section 98)
- Issue of Shares by Public - (Section 99)
- Issue of Shares by Private - (Section 100)

## Company Act 1956:


- Develop the basic types of the procedure for formation of company.
- Identify the role and responsibilities of shareholders in company.
- Understand the importance of company in economy.
- Analyze the development of company.
- Develop their training skills for the business law.

**SEMESTER V: CORE COURSE- X COMPANY LAW AND PRACTICE  
22BC0310  
MAPPING**

**CO-PO-PSO Matrix of Course**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

PO/PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	1	3	2	1	2	-
CO2	2	2	3	2	1	3	2	3	2	1
CO3	3	2	3	3	2	3	3	2	2	3
CO4	2	2	3	3	2	2	3	2	3	3
CO5	3	3	2	3	3	2	1	1	2	3
AVERAGE	2.6	2.2	2.8	2.6	1.8	2.4	2.2	2.2	2.2	2

  
 Director  
 Department of Management Studies  
 Shri Matai Indira Gandhi College  
 Tiruchirappalli - 620 002.

## Syllabus

### SEMESTER V: CORE COURSE- XI

### RESEARCH METHODS FOR BUSINESS

Course Code: ZHCUBB11

Max. Marks: 100

Credit : 5

Hours/Week : 5

Internal Marks : 25

External Marks : 75

#### COURSE OBJECTIVES:

- To comprehend the theoretical concepts and research logic.
- To familiarized with the various stages of the research work.
- To gain knowledge about the formulation of business research projects.

#### UNIT – I:

Research: Meaning – Definition – important – Types – Methods – Process – Quality of good research – problem faced by researcher in India.

Research Problem: Selecting problem – Technique.

#### UNIT – II:

Research Design: Meaning – Concepts – Categorize of Research Design. Sampling Design: Different Census survey and sample survey – Steps – Type.

#### UNIT- III:

Sample size: Points to be consider sample size determination – Approach based on Precision rate and confidence level

Scaling: Measuring scale – Sources of Error in Measurement – Test of sound

Measurement – Techniques. Data Collection: Primary and secondary data meaning – Collection of Primary Data – Collection of Primary Data.

#### UNIT – IV:

Processing of Data: Editing – Coding – Classification – Tabulation. Concept of standard error: Criteria for judging Significance at Various levels. Hypothesis: Meaning – Basic concept of Hypotheses testing – Flow diagram for testing.

#### UNIT – V:

Analysis of Data: Measure of Central Tendency – Chi-Square test. Interpretation: Meaning – Technique. Report Writing: Steps – Layout of project Report.

## UNIT 11: QUANTILE CORRELATION OF ROBUST ESTIMATOR (Only)

### Learning Objectives are:

- a. Construction of Quantile Correlation and Application thereof in  
Calculation of Robustness Parameter.
- b. Explain Robustness and MQRs (robustness) statistical and financial risk.  
c. Explain theory and application.

### Learning Objectives:

- CO1 To solve the problem by identifying robust estimator.
- CO2 To prepare a research paper on any other topic of interest and
- CO3 To implement quality control system in order to ensure quality and safety  
work.
- CO4 To assess the validity and reliability of a study's research findings.
- CO5 To assess the robustness through high-quality source.


**SEMESTER V: CORE COURSE- XI: RESEARCH METHODS FOR BUSINESS  
22BC0011**

**MAPPING**

**CO-PO-PSO Matrix of Course**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	1	3	2	1	2	-
CO2	2	3	3	2	1	3	2	3	2	1
CO3	3	3	3	2	2	2	3	2	2	3
CO4	2	3	3	2	2	2	3	2	3	3
CO5	3	3	3	2	1	2	1	1	2	3
AVERAGE	2.6	3	3	2	1.8	2.4	2.2	2.2	2.2	2

  
 Director  
 Department of Management Studies  
 Shri Mata Jyoti Basani College  
 Tiruchirappalli - 620 032

## Syllabus

### SEMESTER V: MAJOR BASED ELECTIVE COURSE- I I. STRATEGIC MANAGEMENT

Course Code : Z2RMBE001

Max. Marks : 100

Credit : 5

Hours/Week : 5

Internal Marks : 25

External Marks : 75

#### COURSE OBJECTIVES:

- To expose students to various perspectives and concepts in the field of Strategic Management
- The course would enable the students to understand the principles of strategy formulation, implementation and control in organizations.
- To help students develop skills for applying these concepts to the solution of business problems

#### UNIT – I:

The Concept of Strategy - Strategic Decisions - Strategic Management - Concept - Benefits - Limitations - Strategic Management Process - Approaches.

#### UNIT – II:

Mission, Objectives - Need for Environmental Scanning - SWOT Analysis.

#### UNIT – III:

Strategy Formulation - Business Strategy - Corporate Strategy - Portfolio Analysis - BCG Matrix - Uses - Limitations.

#### UNIT – IV:

Strategy Implementation - MBO - Functional Implementation - Production - Marketing - Finance Personnel - Research and Development.

#### UNIT – V:

Strategy Evaluation and Control - Strategic Control - Evaluation Techniques.

#### UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :

Contemporary development related to prepare a project report on Industry and Company comprehensive analysis based on General, Industry, Competitor and Internal Environment, SWOT summary and implementation. It can be done as a group project which should also include suggestions based on problem identification and solutions.

## COURSE OUTCOMES

- CO1 Explain and evaluate mission statement, long term objective, vision, and short term plan for the business.
- CO2 Analyze the external and internal environment and identify opportunities, threats, strengths and weaknesses of the firm and thereby formulate appropriate strategies for business.
- CO3 Plan pre-implementation and implementation phase; and
- CO4 Monitor and evaluate implemented strategies.
- CO5 Students will be able to develop their capacity to think and execute strategically.




**SEMESTER V: MAJOR BASED ELECTIVE COURSE- I  
1. STRATEGIC MANAGEMENT**

**ZIMBABWE  
MAPPING**

**CO-PO-PSO Matrix of Course**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2	1	2	1	1	2	1	2	-
CO2	2	2	1	2	1	3	2	3	2	1
CO3	1	2	1	1	2	2	1	2	2	1
CO4	2	2	1	3	2	2	1	2	1	1
CO5	1	3	2	1	1	2	1	1	2	1
AVERAGE	1.6	2.2	1.8	2.0	1.8	2.4	2.2	2.2	2.2	1

  
 Director  
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 Shri Matai Indira Gandhi College  
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## Syllabus

### SEMESTER V: MAJOR BASED ELECTIVE COURSE- I 1. SUPPLY CHAIN MANAGEMENT

Course Code : 22BMDE002  
Max. Marks : 100  
Credit : 5

Hours/Week : 5  
Internal Marks : 25  
External Marks : 75

#### COURSE OBJECTIVES:

- To provide an insight on the fundamentals of supply chain networks, tools and techniques.
- To provide an in-depth coverage of management issues, challenges and practices in different subsystems of Supply Chain Management and their inter-relationships.
- To expose students to the state of the art developments in Management concepts and techniques and Information Technology Relevant for effective and efficient Supply chain Management.

**UNIT – I:** Development of SCM concepts and Definitions -Supply Chain Management and Key components, External Drivers of Change, Dimensions of Logistics - The Macro perspective and the micro dimension – Logistic system analysis.

**UNIT – II:**  
Sourcing strategy: Manufacturing flow management – make or buy decision – capacity management – Materials Management – choice of sources – procurement planning.

**UNIT – III:**  
Distribution strategy: Choice of Market – network design – warehouse design/operation and distribution planning – transportation – packaging.

**UNIT – IV:**  
Inventory Strategy: Demand forecasting – inventory planning – planning of stocking facilities – warehouse location allocation, Warehouse design and operations – inventory norms.

**UNIT – V:**  
Channels of Distribution – Customer Service Strategy: Identification of service needs, cost of services/revenue Management.

## UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :

Contemporary development related to Assignment/Presentation based on the above topics or the selected Industry or Firm.

### COURSE OUTCOMES:

- CO1 The student would understand the framework and scope of supply chain networks and functions.
- CO2 Gain overall knowledge about the modern business practices of Supply Chain Management and its emerging trends and best practices at global level.
- CO3 Know and understand the basic concepts, principles, functions and models of various components of Supply Chain Management.
- CO4 Understand and analyze the operations and logistic management through IT – Internet and web.
- CO5 Apply supply chain strategies in various functions of production and logistic management all throughout the process.

SEMESTER V: MAJOR BASED ELECTIVE COURSE-1

2. SUPPLY CHAIN MANAGEMENT

22BNDHE02

MAPPING

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	1	3	2	1	2	-
CO2	2	3	3	2	1	3	2	3	2	1
CO3	1	2	3	3	2	2	3	2	2	3
CO4	2	2	3	1	2	2	3	2	1	3
CO5	3	3	2	3	3	2	1	1	2	1
AVERAGE	2.4	2.2	2.8	2.6	1.8	2.4	2.2	2.2	2.2	2

*Ravindranth Reddy*  
Signature of the Director

Director  
Department of Management Studies  
Shri Mataji Indira Gandhi College  
Tiruchinappalli - 620 002.

## Syllabus

### SEMESTER V: SKILL BASED ELECTIVE COURSE- I SERVICES MARKETING

Course Code : ZIBSHE3011  
Max. Marks : 100  
Credit : 5

Hours/Week : 5  
Internal Marks : 25  
External Marks : 75

#### COURSE OBJECTIVES:

- Know the various concepts of services marketing
- Understand the strategies for managing and marketing of services and
- Devise strategies for marketing services in the liberalized business environment.

#### UNIT – I:

Services marketing – Introduction – Growth of service sector – Types – Characteristics – Constraints in services marketing – Difference between goods & services.

#### UNIT – II:

Marketing Management process for services – organizing marketing planning – Analysing opportunities – target market – Developing the services marketing Mix.

#### UNIT – III:

Strategies for managing capacity to match demand – Strategies for managing demand to match capacity – Services Marketing Mix elements.

#### UNIT – IV:

Service product – analysis of the service offer – service planning – factors affecting pricing decisions – special issues of service pricing.

#### UNIT – V:

Promotion Mix for services – Place in service – Identifying & Evaluating major channels/marketing – physical factors – physical environment.

## UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only)

Practical: Collection of Data regarding Marketing Mix

### COURSE OUTCOME:

- CO1 Students gain knowledge about the basic concepts of Services marketing.
- CO2 Students develop skills to tackle the challenges in Marketing Mix.
- CO3 To know the Strategy followed in the products.
- CO4 Students know about the promotion mix, pricing decision.
- CO5 Students gain the Practical Knowledge about the market activities.

**SEMESTER V: SKILL BASED ELECTIVE COURSE - I SERVICES MARKETING  
(2020BEM)  
MAPPING**

**CO-PO-PSO Matrix of Course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	1	3	2	2	3	2
CO2	2	1	-	2	3	2	3	2	1	-
CO3	-	1	2	2	1	2	3	2	1	-
CO4	-	-	1	2	1	2	3	1	2	3
CO5	3	3	2	1	2	3	2	3	2	2
AVERAGE	1.6	1.6	1.4	2.2	1	2.4	2.6	2.4	1.6	2.2



Signature of the Director

Director  
Department of Management Studies  
Shri Mataji Indira Gandhi College  
Tiruchirappalli - 620 002.



**SHRIMATI INDIRA GANDHI COLLEGE**

Nationally Accredited at 'A' Grade (3<sup>rd</sup> Cycle) by NAAC

An ISO 9001 : 2015 Certified Institution

Tiruchirappalli - 620 002

**DEPARTMENT OF BUSINESS ADMINISTRATION**

**MAPPING PO AND CO**

**EVEN SEMESTER**

**2022-2023**





# SHRIMATI INDIRA GANDHI COLLEGE

Nationally Accredited at 'A' Grade (3<sup>rd</sup> Cycle) by NAAC.

An ISO 9001 : 2015 Certified Institution

Tiruchirappalli - 620 002

## DEPARTMENT OF BUSINESS ADMINISTRATION

### EVEN SEMESTER

#### PROGRAMME OUTCOMES (UG) (PO)

**PO1** Have a broad body of knowledge in business management concepts, current practices in global business environment and emerging technologies to support, sustain and innovate business.

**PO2** Attain problem solving, decision making and critical thinking skills to provide viable solutions for business problems.

**PO3** Appreciate diversity to communicate effectively in international and cross-cultural contexts, and facilitate collaborative professional partnerships.

**PO4** Have the ability to work and collaborate as a team member and contribute to achievement goals.

**PO5** Recognize, explain and illustrate the importance of ethical conduct and resolve Ethical issues in business.

#### PROGRAMME SPECIFIC OUTCOMES:

**PSO1** Acquire adequate knowledge through principles, theory and models of business management, Accounting, Marketing, Finance and Human Resource.

**PSO2** Demonstrate proficiency for Business Communication for effective and professional business management principles in solving complex business issues.

**PSO3** Analyze and comprehend the applicability of management principles in solving complex business issues.

**PSO4** Develop entrepreneurial skills to become an entrepreneur.

**PSO5** Comprehend the applicability of management principles in the situations pertaining to global business world.

  
Signature of the Director

Syllabus  
SEMESTER III CORE COURSE- III  
MARKETING MANAGEMENT

Course Code : 22BCC813  
Max. Marks : 100  
Credit : 5

Hours/Week : 6  
Internal Marks : 25  
External Marks: 75

**COURSE OBJECTIVES:**

- To expose students to marketing concepts and trends in the market.
- To promote the ability to relate consumer behavior and market trends
- To make students realize the relationship between marketing channels and corresponding strategies.

**UNIT- I:**

Market and Marketing: Distinction between marketing and selling - Types of market - Concepts - Functions - Marketing management - Objectives - Importance - Marketing Environment-Marketing Information System.

**UNIT- II:**

Market Segmentation : Criteria of effective segmentation- Benefits- Bases for market segmentation-Factors influencing consumer behavior-Buyer motives-Buying process.

**UNIT-III:**

Marketing Mix - Product planning and development - Product mix decisions - New product development-Product life cycle and strategies- Pricing-Meaning-Influencing factors - Objectives - Pricing methods.

**UNIT-IV:**

Marketing channels -Need and importance - Classification - Types of Intermediaries - Wholesalers - Functions - Retailers - Functions - Physical distribution - Elements of physical distribution (logistics)

**UNIT-V:**

Promotion mix- Personal selling-Process-Advertising-Objectives-Types-Sales promotion- Objectives-Sales promotion methods, publicity and public relations.

**UNIT-VI CURRENT CONTENDERS (the Continuous Internal Assessment only)**

Practical - To sell the goods in their area (This Unit is only for CIA Evaluation)

**COURSE OUTCOME-**

**CO1** Students gain knowledge about the basic concepts of marketing

**CO2** Students develop skills to tackle the challenges and boost development in Marketing/Management

**CO3** Awareness of buyer's behavior becomes better among students

**CO4** Students gain the Practical Knowledge to sell the goods

SEMESTER II CORE COURSE- III MARKETING MANAGEMENT (BCC203)

MAPPING

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	1	3	2	1	2	-
CO2	2	2	3	2	1	2	2	3	2	1
CO3	3	2	3	1	2	2	3	2	2	3
CO4	2	2	3	3	2	2	3	2	3	3
CO5	3	3	2	3	3	2	1	1	2	3
AVERAGE	2.6	2.2	2.8	2.6	1.8	2.4	2.2	2.2	2.2	2

  
Signature of the Director

**Syllabus**  
**SEMESTER II-CORE COURSE-IV**  
**BUSINESS MATHEMATICS AND STATISTICS**

Course Code : **22BC0304**  
Max. Marks : **100**  
Credit : **3**

Hours/Week : **6**  
Internal Marks : **25**  
External Marks : **75**

**OBJECTIVES:**

- To make students understand and use basic mathematical and statistical tools.
- To promote the ability to appropriate statistical techniques in business.
- To help students analyze management problems in research and decision making.

**UNIT – I:**

Differentiation - Derivation of standard Function, Addition, Difference and product Rule, Maxima and Minima - Application of Derivatives in Business.

**UNIT – II:**

Matrices and Determinants - Definition - Basic concepts - Addition, Subtraction and Multiplication of Matrices

Elementary Operations: Transpose of a Matrix, Inverse, and Solving equations by matrix method - Determinants and Solution of Simultaneous Linear Equations.

**UNIT – III:**

Statistics - Definition - Name - Scope and Objectives - Diagrammatic representation - One, two and three dimensional diagrams - Graphic representation-Histogram, Frequency Polygon, Frequency Curve, Histogram and Pie diagram - Classification and tabulation.

**UNIT – IV:**

Measures of Central Tendency - Mean Median, Mode, Geometric Mean and Harmonic Mean - Measures of Dispersion - Range, Quartile Deviation, Mean Deviation, Standard Deviation and coefficient of variation.

**UNIT – V:**

Simple Correlation - Karl Pearson's Co-efficient of Correlation and Spearman's Rank Correlation - Simple Regression Analysis.

**(Theory 40 % and Problems 60%)**

**UNIT-VI CURRENT CONTOURS (for Continuous Internal Assessment only)**

Contemporary Developments Related to the Course during the Semester - conceptual-Practical: Studying and measuring matrix patterns in Petrol Banks, retail shops.

**COURSE OUTCOMES:**

- CO1 Understand how differentiations are used as mathematical tools in Business.
- CO2 Understand how matrices and determinants are used as mathematical tools in Business.
- CO3 Able to use the appropriate statistical techniques in Business
- CO4 Able to develop a strategic approach to organize and analyze the data
- CO5 Analyze the management problems in research and decision making.

## SYLLABUS

## MAPPING

## CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO										
CO1	3	2	3	3	1	3	2	2	2	1
CO2	2	2	3	3	1	1	2	2	2	1
CO3	3	2	3	3	2	2	1	2	2	1
CO4	2	2	3	3	1	2	3	2	1	3
CO5	3	2	2	3	3	2	1	2	2	3
AVERAGE	2.8	2	2.8	3	1.8	2.4	2.2	2	2.2	2

*Dr. Anurag Kumar Singh*  
Signature of the Director

By Rules  
**SEMESTER II FIRST SEMESTER COURSE - II**  
**BUSINESS ENVIRONMENT**

Course Code : 220PAC0302

Max. Marks : 100

Credit : 1.2

Hours/Week : 4

Internal Marks : 25

External Marks : 75

**OBJECTIVES:**

- To provide basic understanding of the concepts of business environment.
- To provide broad knowledge on domestic and international environment.
- To make learners the impact of environment on business.
- To understand the different environment in the business climate.
- To know the major and minor factors affecting the business in various aspects.
- To know the different environment (i.e. political, technological and socio-economic environment) in the business.

**UNIT - I**

Business - Scope - Characteristics - Goals - Criticisms - Business Environment - Objectives and types. Recent Development in New Economic Policy (1991) and its Impact on Business- Union Budget as an instrument of growth and its Impact on Business.

**UNIT - II**

Economic Environment- Concept - Factor-Basic Economic System - Economic Planning- Privatization - Nature and objectives.

**UNIT - III**

Political Environment- Political Institutions- Legislature, Executive and Judiciary - Government in Business-Regulatory, Intervention and Participatory roles. Constitutional Provisions affecting Business-An overview of major laws affecting business.

**UNIT - IV**

Financial Environment - Financial System - RBI - Commercial banks- International Economic Institutions - World Bank - IMF - WTO.



## UNIT - V:

Social and Cultural Environment: Impact of Culture on Business - People's Attitude to Business and Work-Business and Society - Social responsibility of Business - CSR - Changing age structure and its impact on business-Business and Society-Business and Culture.

## UNIT-VI CURRENT CONTOLERS (for Continuous Internal Assessment only)

Expert lectures, online seminars – webinars.

## COURSE OUTCOME:

- CO1 Develop an understanding on the growth of the business activities.
- CO2 To analyze various categories that constitute the business environment and apply various approaches that is helpful to manage both the internal and external environment of the business.
- CO3 To apply the various types of policies in the economic environment, applying these policies change the structure of the economy and the transition there of from the past to the present scenario.
- CO4 Comprehend the environmental factors that are conductive/attributable to the respective businesses.
- CO5 Facilitating the learners understand, analyze and take decisions for a given international business environment.

**SEMESTER II: FIRST ALLIED COURSE- II (BUSINESS ENVIRONMENT)**

**LEARNING**

**MAPPING**

**(CI-PO-PSO Matrix of Course)**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	1	1	2	2	2	1
CO2	2	2	3	2	1	3	2	2	2	1
CO3	3	2	3	3	2	2	3	2	2	1
CO4	2	2	3	3	2	2	3	2	3	1
CO5	3	2	2	3	3	2	1	2	2	3
AVERAGE	2.6	2	2.8	3	1.8	2.4	2.2	2	2.2	2

  
 Signature of the Director

**Syllabus**  
**SEMESTER IV, CORE COURSE - VII**  
**ORGANIZATIONAL BEHAVIOUR**

Course Code: 22BCCB07  
Max. Marks : 100  
Credit : 5

Hours/Week : 6  
Internal Marks : 25  
External Marks : 75

**COURSE OBJECTIVES:**

- To provide basic knowledge on various models of organizational behavior.
- To expose them to the concepts of motivation and group dynamics.
- To help them acquire interpersonal skills.

**UNIT - I:**

Organizational Behaviour – Concept – Nature – Objectives and elements of OB- Importance of OB- Models of OB – Other similar fields of study – Disciplines contributing to Organizational Behaviour - Individual Behaviour - Personality-Determinants – Personality development- Theories on Personality.

**UNIT - II:**

Perception – Definition – Process and determinants of Perception – Attitudes- Nature and formation of Attitudes- Values - Group Dynamics – Formal and Informal Groups-Group Norms, Group Cohesiveness and Group Decision making.

**UNIT - III:**

Leadership – Concept – Qualities of effective Leadership – Leadership Styles – Definition of Power – Types of Power - Sources of power – Power and Politics.

**UNIT - IV:**

Definition of Authority – Characteristics – Types of Authority - Morale – Concept – importance – Measurement of Morale – Steps to improve Morale in an organization.

## **UNIT – VI**

Motivation - Concept - Sources - significance - Theories of Motivation - Maslow's need hierarchy theory - McGregor's Theory X and Theory Y - Herzberg's Two-Factor Theory - Stress Management - Concept - Sources - Effects of stress - Management of Stress.

## **UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Contemporary Developments related to this Course Role Play, Group Discussion, case studies and seminars.

### **COURSE OUTCOMES**

- CO1 Have an insight on how employees behave and perform in the workplace
- CO2 Analyze the individual and group behavior and understand the implications of Organizational behavior on the process of management.
- CO3 Understand their own behavior, attitude, ethical views and performance as well as those of the people with whom they behave.
- CO4 Demonstrate how to make better decisions both as an individual and in a group.
- CO5 Apply different motivational theories and methods to increase the productivity and job satisfaction of employees.

SEMESTER IV: CORE COURSE – VII ORGANIZATIONAL BEHAVIOUR

22BAACBT

MAPPING

CO-PO-PSO Mapping of Course

1: High (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	3	2	1	1	2	1	2	-
CO2	2	2	3	2	1	1	2	3	2	1
CO3	1	2	3	3	2	2	3	2	2	3
CO4	2	1	3	3	2	2	3	2	1	3
CO5	1	3	3	3	3	2	1	1	2	3
AVERAGE	2.4	2.2	3	2.8	1.8	2.4	2.2	2.5	2.2	2

*[Handwritten Signature]*  
Signature of the Director

**Syllabus**  
**SEMESTER IV: SECOND ALLIED COURSE - II**  
**OPERATIONS RESEARCH-II**

Course Code :22BC3102  
Max. Marks : 100  
Credit : 3

Hours/Week : 4  
Internal Marks : 25  
External Marks: 75

**COURSE OBJECTIVES:**

- To understand the Business methods used in Operations Research.
- To allocate limited resources with optimum utilization in production and gain knowledge replacement decisions.

**UNIT - I:**

Operations Research - Concepts - Models - Scope - Phases - Limitations - Operations Research and Decision Making - Linear Programming Problem: Formulation of L.P.P. - Graphical Method.

**UNIT - II:**

Transportation Problem: North West Corner Rule - Least-Cost Method - Vogel's Approximation Method.

**UNIT - III:**

Assignment Problem: Solving assignment Problem - Travelling Salesman Model - Maxima and Minima Method - Hungarian Method.

**UNIT -IV:**

Inventory Control: Categories of Inventory - reasons for carrying inventory - costs and terms associated with inventory - Deterministic and Probabilistic Inventory Problem.

**UNIT - V:**

Replacement Decisions: Replacement of equipment that deteriorates gradually - Replacement of Equipment that fails suddenly.

**UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester concerned. Practical: Conduct of Employee survey and reporting- Review and evaluation of inventory control.

**(Marks: Theory 20% and Problems 80%)**

## **COURSE OUTCOMES:**

- CO1 Formulate and obtain the optimal solution for Linear Programming problems.
- CO2 Determine the optimal solution for Transportation problems.
- CO3 Determine the optimal solution for Assignment problems.
- CO4 Understand the need of inventory control and Management.
- CO5 Decide an optimal replacement decision for given equipment.

SEMESTER IV: SECOND ALLIED COURSE – II OPERATIONS RESEARCH  
 IIRCCHE2  
 MAPPING

CO-PO-PSO Matrices of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	1	3	2	3	2	1
CO2	2	2	3	2	1	3	2	3	2	1
CO3	3	2	3	3	2	2	3	2	2	1
CO4	2	2	3	3	2	2	3	2	3	1
CO5	3	3	2	3	3	2	1	1	2	1
AVERAGE	2.6	2.2	2.8	2.6	1.8	2.4	2.2	2.2	2.2	1

*[Signature]*  
 Signature of the Director



**Syllabus**  
**SEMESTER IV: NON MAJOR ELECTIVE COURSE - D**  
**I. BUSINESS ETHICS**

Course Code : Z2INME80  
Max. Marks : 100  
Credit : 2

Hours/Week : 2  
Internal Marks : 25  
External Marks : 75

**COURSE OBJECTIVES:**

- To understand the concept of Ethical values
- Analyse the ethical issues involved in business
- The best way to manage ethical conduct in business

**UNIT – I:**

Business Ethics - Meaning - Definition - Nature - Importance - Ground Rules - Myths - Methodology - Characteristics of Managerial Ethics - Factors Influencing Business Ethics - Types Of Ethical Issues- Corruption In Business.

**UNIT – II:**

Ethical Values - Work Ethics - Work Culture - Ethical Theories - Ethical values- Environmental Ethics - Consumer Protection.

**UNIT – III:**

Managing Ethical Conduct - Skills for Managers - Whistle Blowing - Individual Differences and Ethical Judgments - Cognitive Barriers to Ethical Judgment- Corporate Social Responsibility towards the community.

**UNIT – IV:**

Corporate Governance - Issues - need - corporate governance code - transparency & disclosure - role of auditors - board of directors and share holders - corporate scams - Committees in India.

**UNIT – V:**

Consumerism - unethical issue in sales, marketing and technology - competitive strategy.

**UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Practical: Collection of data about unethical strategy followed in the products.

**COURSE OUTCOME:**

- CO1 To outline the significance of ethics in business.
- CO2 To know the culture of organization.
- CO3 To appreciate the best ethical practices in every actions of organization.
- CO4 To recognize the importance of Corporate Social Responsibility.
- CO5 Students can understand the unethical issues in the environment.

**SEMESTER IV: NON MAJOR ELECTIVE COURSE - II**  
**4. BUSINESS ETHICS**  
**DETAILED**  
**MAPPING**

**CO-PO-PSO Matrix of Course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	1	3	2	3	2	1
CO2	2	2	3	2	1	3	2	3	2	1
CO3	1	2	3	2	2	2	3	2	2	3
CO4	2	2	3	2	2	2	3	2	3	3
CO5	2	2	3	2	1	2	1	1	2	3
AVERAGE	2	2	3	2	1.8	2.4	2.2	2.2	2.3	2

*Aravind Kumar*  
 Signature of the Director

SEMESTER IV: NON MAJOR ELECTIVE COURSE - II  
2. PRODUCTION AND MATERIALS MANAGEMENT

Course Code : 22ENME304  
Max. Marks : 100  
Credit : 3

Hours/Week : 2  
Internal Marks : 25  
External Marks : 75

**COURSE OBJECTIVES:**

- To develop an understanding of how the operations, have strategic importance and can provide a competitive advantage in the workplace.
- To understand the relationship between operations and other business functions.
- To understand the Materials Management function starting from Demand Management through Inventory Management.

**UNIT-I SCOPE AND SIGNIFICANCE OF PRODUCTION MANAGEMENT:**

Production, operation function - objectives of production management, scope of production management, Type of production and production interface with other functional area of business, Plant locations - factors affecting plant layout - different type of layouts and their suitability.

**UNIT-II PRODUCTION PLANNING, SCHEDULING AND MONITORING SYSTEM:**

Concept and need of production planning - factors - Elements of production planning, capacity planning - Aggregate planning - Method study - Work measurement - Time study - Motion study - Scheduling.

**UNIT-III MATERIAL MANAGEMENT:**

Concepts, objectives and importance of material management - Material handling - principles of materials handling- Material requirement planning.

**UNIT-IV INVENTORY CONTROL:**

Nature of inventory - types of inventory - cost of holding inventory - Techniques of inventory control - EOQ - VED analysis - ABC analysis.

**UNIT-V QUALITY CONTROL:**

Inspection and quality control, Statistical quality control - Techniques of SQC - Acceptance sampling - Control charts.

## **UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only)**

Contemporary development related to the production strategies, work measurement techniques, production planning, maintenance management techniques and quality control techniques in selected firm's plant locations.

### **COURSE OUTCOMES:**

- CO1 Identify the elements of operations management and various transformation processes enhance productivity and competitiveness.
- CO2 Analyse and evaluate various facility alternatives and their capacity decisions, develop balanced line of production & scheduling and sequencing techniques in operation environments.
- CO3 Develop aggregate capacity plans and MPS in operation environments.
- CO4 Plan and implement suitable materials handling principles and practices in the operations.
- CO5 Plan and implement suitable quality control measures in Quality Circles in TQM

SEMESTER IV: NON MAJOR ELECTIVE COURSE – II  
**2. PRODUCTION AND MATERIALS MANAGEMENT**

**IIIMM2024**

**MAPPING**

**CO-PO-PSO Matrix of Course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	1	1	2	1	2	1
CO2	2	1	1	2	1	1	2	3	2	1
CO3	1	2	1	3	2	2	3	2	2	1
CO4	2	2	1	1	2	2	1	2	3	1
CO5	3	1	2	1	3	2	1	1	2	1
AVERAGE	2.6	2.2	2.8	2.6	1.8	2.4	2.2	2.1	2.1	2

*Director, IIIM*  
 Signature of the Director

Course Code : 22BCC0112  
Max. Marks : 100  
Credit : 5

Hours/Week : 5  
Internal Marks : 25  
External Marks : 75

### COURSE OBJECTIVES:

- To help students understand of the basic elements of HRM gain knowledge on various facets, the policies and practices of HRM and acquire knowledge on the recent trends in HRM.
- To impart knowledge in management and to provide basic conceptual skills and aptitude in the primary business activities so as to enable the aspiring students to exploit the business related opportunities.
- The functions, systems, policies and applications of Human Resource Management in organizations.
- An overview of theoretical foundations of key areas associated with HR development in the organizations.
- HR skills and their ability to assess the constraints and opportunities associated with managing employees in different socio-economic and political context.

### UNIT – I:

Human Resource - Definition – Characteristics and Objectives – Principles of HRM– Functions of Personnel Department – Managerial and Operative Functions– Qualities of Personnel Manager- Functions, Organizational Structure of Personnel Department.

### UNIT – II:

HR Planning - Basics and needs – Factors - Objectives of Manpower Plan-Steps in HR Planning – Job Analysis, Job Description and Job Specification - Recruitment-Selection- Interviews and Tests and Placement of Personnel.

### UNIT – III:

Computer Applications in Human Resources Management- Computer applications in personnel training & EDP -Types of applications–Training – Objectives – Methods – Importance of Executive Development –Methods – Promotion- Criteria and types – Transfer - Types - Career Planning.

### UNIT – IV:

Wages- Different methods of wage payments – Time and Piece rate system – Incentive Schemes - Fringe benefits.

ENIT - VI

Performance Evaluation- Importance – Methods- Discipline and Disciplinary procedure –  
Grievance Steps in Grievance Handling.

ENIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only)

Contemporary development related to how HR approach that merges the traditional method of personnel management with corporate strategy, while also focusing on organisational development.

**COURSE OUTCOMES:**

- CO1 The Students are able to exhibit fundamental and basic knowledge of Human Resource Management to solve the practical problems in business in systematic manner.
- CO2 The Students are able to identify and develop strategies for better practice for betterment of business in the most ethical manner.
- CO3 The Students are able to communicate effectively in the organization with confidence and contribute to exchange of ideas, skills and enhance team ability within the organization.
- CO4 The Students will exhibit healthy and self-sustainable leadership and entrepreneur qualities that encourages taking decisions on the basis of calculated risk and enhance the competitive advantage of the organization.
- CO5 To gain knowledge HRM and its significance in business.



# SEMESTER VI COURSE COURSE- VI HUMAN RESOURCE MANAGEMENT

IBC'CHH1

MAPPING

## CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
IBC'CHH1	1	2	3	2	1	3	2	1	2	0
IBC'CHH1	2	2	3	2	1	3	2	3	2	1
IBC'CHH1	3	2	3	3	2	2	3	2	2	3
IBC'CHH1	2	2	3	3	2	2	3	2	3	3
IBC'CHH1	3	3	2	3	1	2	4	1	2	3
AVERAGE	2.0	2.2	2.8	2.6	1.8	2.4	2.3	2.2	2.2	2

*Amulya Kant Singh*  
Signature of the Director

Syllabus  
SEMESTER VI CORE COURSE- XIII  
MANAGEMENT ACCOUNTING

Course Code : 21BC08012

Max. Marks : 100

Credit : 5

Hours/Week : 5

Internal Marks : 25

External Marks : 75

### COURSE OBJECTIVES:

- Understand the nature and scope of management accounting.
- Gain knowledge in the preparation of financial statement analysis, marginal costing budget, working capital, standard costing and
- Utilize the management tools and techniques to take appropriate financial decisions.

#### UNIT - I:

Management Accounting - Definition - objectives - Merits and Limitations - Financial Statement Analysis - Comparative Statements - Common Size Statements - Ratio Analysis - Construction of Balance Sheet ( simple problem).

#### UNIT - II:

Fund Flow Statement - Cash Flow Analysis - Uses and Construction - Distinction.

#### UNIT - III:

Marginal Costing - objectives and Limitations - Cost Volume Profit (CVP) Analysis - Break Even Analysis - Merits and Demerits - Margin of Safety

#### UNIT - IV:

Budget and Budgetary Control - Characteristics and Limitations - Preparation of Sales, Production, Raw material Cost, Cash, Master Budgets and Flexible Budgets.

#### UNIT - V:

Working Capital - Types - Factors Determining Working Capital - Estimate of Working Capital Requirements - Standard Costing - Material and labour Variance only.

(MARKS : Theory 40% and Problems 60%)

## UNIT 03 : ENVIRONMENTAL ACCOUNTING (The Environment Accounting Statement)

Contemporary development related to environmental and public accounting is to report the operations of organizations through the disclosure of management accounting statements.

### CONTENTS OF THE COURSE

- 001 Measure the financial statements through responsibility and account cost by using environmental ratios.
- 002 Supply the fund flow and cost flow statements by including back and cost components.
- 003 Prepare various budgets and apply standard costing for material systems, variable overhead cost, volume cost.
- 004 Prepare a Statement, that includes the aims and objectives of the business and a series of key performance indicators and targets.
- 005 From the literature at the corporations will establish and manage the process and the environmental aspects and methods to manage the business in a sustainable and efficient manner.

SEMESTER V- CORE COURSE- XIII MANAGEMENT ACCOUNTING  
 (21BC0313)  
 MAPPING

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	3	3	2	2	3	3
CO2	2	1	2	2	3	2	3	2	3	-
CO3	2	1	2	2	1	2	3	2	3	-
CO4	2	1	2	2	1	2	3	3	2	3
CO5	2	1	2	2	2	3	3	3	2	2
AVERAGE	2	1	2	2	2	2.4	2.8	2.4	2.8	2.2

*Signature of the Director*  
 Signature of the Director

Course Code : 218CC0114  
Max. Marks : 100  
Credit : 5

Syllabus  
SEMESTER VI, CORE COURSE- XIV  
ENTREPRENEURIAL DEVELOPMENT

Hours/Week : 5  
Internal Marks : 25  
External Marks : 75

### COURSE OBJECTIVES:

- Understand the concepts of entrepreneurship development
- Acquire requisite knowledge and skills for becoming successful entrepreneurs and
- Formulate and develop business projects.

### UNIT - I:

Entrepreneurship – Evolution of entrepreneurship - Traits of an Entrepreneur  
– Functions– Types of Entrepreneurs – Role of Entrepreneurship in Economic  
Development - Distinction between Entrepreneur, Intrapreneur and  
Entrepreneurship.

### UNIT - II:

Entrepreneurial Environment – Factors affecting Entrepreneurial Growth -  
Entrepreneurial Motivation – Need for Achievement Motivation - Barriers to  
Entrepreneurship Development.

### UNIT - III:

Entrepreneurship Development Programme (EDP) - Need for EDP - Objectives,  
Phases of EDP  
– Course Content and Curriculum of EDP – Problems of women  
entrepreneurs – EDP Institutions in India, their functions and financial support  
for entrepreneurs - DIC, TIC, SISI, SIPCOT and SIDBI.

### UNIT - IV:

Project Management – Concept of Project and Classification – Sources of a  
Business Idea - Project Identification – Project Formulation – Project  
Appraisal Methods - Preparation of Project Reports.

## ENT- V)

Incentives and Subsidies – Incentives to Small Scale Industries – Problems of Small Scale Industries – Merits and Demerits of Family Business – Benefits of Industrial Units located in Backward Areas – Industrial Estates.

## ENT-VI – CURRENT CONTOURS (For Continuous Internal Assessment Only):

The course encompasses speaking skills developed through in-class discussion of materials, case study analysis and current entrepreneurship - related issues.

### COURSE OUTCOME:

- CO1 Examine the problems and challenges of setting up a new business.
- CO2 Provide information on institutional support, business opportunities and creating a business plan.
- CO3 Identify the key steps required to initiate and develop a business enterprise.
- CO4 Delineate the benefits of delivering the project identification and selecting the successful project with the various guidelines issued by the authorities.
- CO5 Motivate the students to become a successful entrepreneur.

SEMESTER VI CORE COURSE- XIV ENTREPRENEURIAL DEVELOPMENT  
 ZBCCBB14

MAPPING

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3	3	3	2	3	3
CO2	2	3	2	3	3	2	3	2	3	3
CO3	-	3	2	2	1	2	3	2	3	3
CO4	-	3	2	2	1	2	3	3	2	3
CO5	3	3	2	3	2	3	2	3	3	2
AVERAGE	1.6	3	2	2.2	2	2.4	2.6	2.4	2.8	3

*Dr. Anand Kumar*  
 Signature of the Director

**Syllabus**  
**SEMESTER VI: MAJOR BASED ELECTIVE COURSE- II**  
**I. CUSTOMER RELATIONSHIP MANAGEMENT**

Course Code : ZEDMHC004

Max. Marks : 100

Credit : 5

Hours/Week : 8

Internal Marks : 25

External Marks : 75

**COURSE OBJECTIVES:**

- To understand the importance and dynamics of CRM.
- To know about customer satisfaction, customer retention and customer identification.
- To train-up use of technological tools in CRM.

**UNIT – I:**

CRM – Introduction – Definition – Need for CRM – Complementary Layers of CRM – Customer Satisfaction – Customer Loyalty – Product Marketing – Direct Marketing.

**UNIT – II:**

Customer Learning Relationship – Key Stages of CRM – Factors Driving CRM – Benefits of CRM – Growth of CRM Market in India – Key Principles of CRM.

**UNIT – III:**

CRM Program – Groundwork for Effective use of CRM – Information Requirement for an effective use of CRM – Components of CRM – Types of CRM.

**UNIT – IV:**

CRM Process Framework – Governance Process – Performance Evaluation Process.

**UNIT – V:**

Use of Technology in CRM – Call Center Process – CRM Technology Tools – Implementation – Requirements Analysis – Selection of CRM Package – Reasons and Failure of CRM.



**UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only):**

Contemporary Developments Related to the Course during the Semester concerned. Practical: Customer relationship management practices in retail industry, hospitality industry, banking industry, telecom industry and aviation industry.

**COURSE OUTCOMES:**

CO1 To be aware of the nuances of customer relationship.

CO2 To analyze the CRM link with the other aspects of marketing.

CO3 To impart the basic knowledge of the Role of CRM in increasing the sales of the company.

CO4 To make the students aware of the different CRM models in service industry.

CO5 To make the students aware and analyze the different issues in CRM.

SEMESTER VI: MAJOR BASED ELECTIVE COURSE- II  
 I. CUSTOMER RELATIONSHIP MANAGEMENT

IRMBEHD

MAPPING

CO-PO-PSO Matrix of Course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3	3	2	2	3	3
CO2	2	1	-	2	3	2	3	2	3	-
CO3	-	1	2	2	1	2	3	2	3	-
CO4	-	-	1	2	1	2	3	3	2	3
CO5	3	3	2	3	2	3	2	3	2	2
AVERAGE	1.6	1.6	1.4	2.2	2	2.4	2.6	2.4	2.6	2.2

*Dr. Anand K. S. S.*  
 Signature of the Director

Syllabus  
**SEMESTER VI: MAJOR BASED ELECTIVE COURSE- II**  
**2. BANKING LAW AND PRACTICE**

Course Code : 22BMBEHH4  
Max. Marks : 100  
Credit : 5

Hours/Week : 5  
Internal Marks : 25  
External Marks : 75

**COURSE OBJECTIVES:**

- To promote an understanding of the basic concepts in banking.
- To acquaint learners with the theoretical and legal concepts of banking in India.
- To help them to attain the competencies required for a career in banking services.

**UNIT-I:**

Banking - Meaning - Definition - Function of banking- Classification of Banks.

**UNIT-II:**

Definition of the terms Banker and Customer- differential relationship between Banker and Customer - General and Special relationship.

**UNIT-III:**

Cheques- Definition of a Cheque - Characteristics of Cheque - Marking - Honor and Dishonor of Cheques. - Crossing of Cheques - Significance - Endorsement- Types.

**UNIT -IV:**

Loans and Advances - Principles of sound lending - Forms of advances - Modes of Charging security - Mortgage, Hypothecation, Pledge and Lien.

**UNIT -V:**

Internet Banking - Electronic payment System- Card Payment ATM, Debit card, Credit card, Smart card - NEFT - RTGS- CTS.

**UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :**

Contemporary Developments Related to Developing skills to take up career opportunities ranging from roles in Finance and Accounting, Banking Industry, Corporate Sector etc.

## COURSE OUTCOMES

- CO1 Demonstrate knowledge among the students with theoretical structures about banking.
- CO2 Train and equip the students with the skills of modern banking.
- CO3 Identify the students will be taken for trainings to banks.
- CO4 To provide the student an understanding of legal and regulatory aspects of banking.
- CO5 Develop skills in Banking Regulations Act and gain practical exposure in the fields of Banking, Finance and Corporate Sector.

**SEMESTER VI: MAJOR BASED ELECTIVE COURSE- II**  
**2. BANKING LAW AND PRACTICE**

**EDMHEB04**

**MAPPING**

**CO-PO-PSO Matrix of Course**

**1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)**

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	3	3	2	2	3	3
CO2	2	3	2	2	3	2	3	2	2	3
CO3	-	3	2	2	1	2	3	2	3	3
CO4	-	3	2	2	1	2	3	3	2	3
CO5	3	3	2	3	2	3	2	3	2	3
AVERAGE	1.6	3	2	2.2	2	2.4	2.6	2.4	2.6	3

*(Signature)*  
**Signature of the Director**

**Syllabus**  
**SEMESTER VI: SKILL BASED ELECTIVE COURSE- II**  
**TOTAL QUALITY MANAGEMENT**

**Course Code :** 22HS2EB02  
**Max. Marks :** 100  
**Credit :** - 2

**Hours/Week :** 3  
**Internal Marks :** 25  
**External Marks :** 75

**COURSE OBJECTIVES:**

- To get familiarized with the basic concept and framework of Total Quality management
- To Understand the contribution of Quality Gurus in TQM journey
- To grasp the nature and importance of various components that constitute TQM

**UNIT-I:**

Introduction – Evolution of quality, Definition, Concept and Features of TQM, - Eight building blocks of TQM.

**UNIT-II:**

TQM thinkers and Thought – Juran Trilogy, PDCA cycle, 5S, Kaizen, Crosby's dairy on Quality Management, Quality Performance Excellence Award- Deming Application Award, European Quality Award, Malcolm Baldrige National Quality Award

**UNIT-III:**

TQM tools- Benchmarking: Definition, concepts, benefits, elements, reasons for benchmarking, process of benchmarking, FMEA, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept and need.

**UNIT-IV:**

Six Sigma- Features of six sigma, Goals of six sigma, DMAIC, Six Sigma implementation, Statistical Process Control- Central Tendency, The seven tools of quality, Normal curve, Control charts, Process Capability.

## UNIT-VI

Quality Systems- ISO 9000, ISO 9000:2008, ENO 14000, other quality systems.

## UNIT-VI CURRENT CONTOURS (For Continuous Internal Assessment Only) :

Practical: Select any organization that adopted any quality standard (i.e. ISO 9000/14000 /18000/ 27000 etc.) and prepare a report on how the quality is managed in operation. Take guidance from your subject teacher / Quality Manager from industry.

## COURSE OUTCOMES:

- CO1 The student would be able to apply the tools and techniques of quality management in manufacturing and service processes.
- CO2 To realize the importance of significance of quality
- CO3 Manage quality improvement teams
- CO4 Identify requirements of quality improvement programs
- CO5 The student manager will be able to explain the concept of Six Sigma in DMAIC process.

**SEMESTER VI: SKILL-BASED ELECTIVE COURSE- II  
TOTAL QUALITY MANAGEMENT**

**CONTENTS**

**MAPPING**

**CO-PO-PSO Matrix of Course**

1: High (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO										
CO1	3	2	1	2	1	3	2	1	2	-
CO2	2	2	3	2	1	3	2	3	1	1
CO3	1	2	3	1	2	3	3	2	1	1
CO4	2	2	1	1	1	2	3	2	1	1
CO5	1	3	2	1	3	2	1	1	2	1
AVERAGE	1.6	2.2	2.1	2.0	1.8	2.4	2.2	2.2	2.2	1

*Dr. Anand K. K.*  
Signature of the Director



# SHRIMATI INDIRAGANDHI COLLEGE

## DEPARTMENT OF TAMIL

### UG PO,CO MAPPING

#### பட்டப்படிப்பின் பயன்கள்

- தமிழ்ப் பாடத்தில் நல்லறிவு பெற்று அதன்வழிப் பெற்றப்பட்ட நல்ல கொள்கைகளைப் பகுத்தாராயும் திறன்களோடு தங்கள் வாழ்க்கையில் கடைபிடிப்பர்.
- தமிழ் இலக்கியம் மற்றும் இலக்கணத் துறையில் பகுப்பாய்வு செய்யும் திறன்களைப் பெறுவர் • நல் திறனும் மேம்பட்ட அறிவும் பெற்ற மாணவர்களால் நல்ல வேலைவாய்ப்பைப் பெறவும், தொழில் முனைவோராக உருவாகவும் உயர் கல்வியைக் கற்கவும் இயலும்•மாணவர்களால் மொழியைப் பிழையின்றி பேசவும் கருத்துக்களை எடுத்துரைக்கவும் இயலும் • அறநெறிப் பண்புகளைக் கற்பதோடு போட்டித் தேர்வுகளுக்குத் தயார்படுத்திக் கொள்வர்

#### பட்டப்படிப்பின் குறிப்பிடத்தக்க சிறப்புப் பயன்கள்

- தமிழ் இலக்கணம் மற்றும் இலக்கியத்தில் துறைபோகிய அறிவைப் பெறுவர்
- தமிழ் இலக்கிய, இலக்கணங்களில் பகுப்பாய்வு செய்யும் சிந்தனைத் திறன்களைப் பெறுவர்
- இலக்கிய விழுமியங்கள் (மதிப்பீடுகள்) வழியாகச் சமூகத்தில் பொறுப்புணர்வை வெளிப்படுத்துவர்
- தமிழிலக்கியத்தின் சிறப்பியல்புகளையும் வகைப்பாடுகளையும் புரிந்துகொள்வதோடு ஊடகத்துறையில் வேலைவாய்ப்பினையும் பெறுவர் .
- பண்டைய தமிழர்களின் நாகரிகம், பண்பாடு போன்றவற்றை அறிவர்

#### பாடங்களின் பயன்கள்

- தமிழ் இலக்கிய, இலக்கண வரலாற்றையும் தமிழக வரலாற்றையும் கால வரிசையில் அறிவர்
- பல்வேறு இலக்கணங்கள் வாயிலாக மொழியின் வளர்ச்சி நிலைகளையும் நெகிழும் தன்மையையும் கண்டறிவர்
- எதுகை, மோனை, முரண் உள்ளிட்ட இலக்கிய நடைகளையும், அழகியல் கூறுகளையும் தமிழ் இலக்கியங்கள் வாயிலாக விளங்கிக் கொள்வர்
- சிறுநிலக்கியங்கள், சமய இலக்கியங்கள், காப்பியங்கள், பண்டைய இலக்கியங்கள் போன்ற இலக்கிய வகைகளையும் இவை வெளிப்படுத்தும் வாழ்வியல் விழுமியங்களையும் உணர்வர்
- அற இலக்கியங்களின்வழி தனிமனித, சமூக மதிப்பீடுகளைத் தெளிவர்
- தமிழகச் சுற்றுலா மற்றும் கோயில் கலைகள், நிர்வாகவியல் தொடர்பான அறிவையும் அத்துறை தொடர்பான வேலைவாய்ப்புகளிலும் முன்னுரிமை பெறுவர்

- சித்தர்களின் சிந்தனைகள், நாட்டுப்புற மரபுகள், தமிழ் நாடகங்களின் வளர்ச்சி நிலைகள், தொல்லெழுத்துகள் மற்றும் கல்வெட்டுகளின் வரலாறுகள் உள்ளிட்ட தமிழின் பன்முகப் பரிமாணங்களையும் அறிவையும் சிந்தனைத் திறன்களையும் மாணவர்கள் பெறுவர் (Students will gain knowledge and thinking skills in the multifaceted dimensions of Tamil, including the thoughts of the Siddhas, folk traditions, stages of development of Tamil drama, history of inscriptions).

- ஒப்பிலக்கியத்தின் தன்மைகளையும் மொழியியலின் நுட்பங்களையும் மொழிபெயர்ப்பியலின் அவசியத்தையும் உணர்வர்.

- தமிழக அரசு நடத்துகின்ற பல்வேறு வேலைவாய்ப்பு குறித்த போட்டித் தேர்வுகளுக்கு ஆயத்தமாகுவதோடு அத்தேர்வுகளில் வென்று அரசு பணிவாய்ப்பினைப் பெறத் தகுதி உடையவராவர்.

## இக்கால இலக்கியம் (கவிதையும் உரைநடையும்)

### அலகு-1

மரபுக்கவிதை - **அ. பாரதியார் பாடல்கள்:**

1. பாரதமாதா திருப்பள்ளியெழுச்சி
2. கண்ணன் என் சேவகன்
3. கண்ணன் என் விளையாட்டுப் பிள்ளை
4. ஆ. பாரதிதாசன் பாடல்கள் குடும்ப விளககு (விருந்தோம்பல்)

### அலகு-2 :

புதுக்கவிதை-

**வணக்கம் வள்ளுவ!**

ஈரோடு தமிழன்பன், பூம்புகார் பதிப்பகம்,  
127, பிரகாசம் சாலை, பிராட்வே, சென்னை - 600 108.  
அலைபேசி: 044-25267543

### அலகு-3

நாடகம்

**-மாமன்னன் இராசராசன்**

முனைவர்கு, வெ.பாலசுப்பிரயன்  
நியூ செஞ்சுரி புக் ஹவுஸ், அம்பத்தூர்,  
சென்னை 600 050.  
செல்.044-26251968, 26258410

### அலகு-4

சிறுகதை- **ஒருசோறு** (தேர்ந்தெடுக்கப்பெற்ற சிறுகதைகள்)

ப. சரிதா

ஸ்ரீ பழனி முருகன் பதிப்பகம், 142 கீழ்த்தெரு, ஆதனக்கோட்டை,  
கருக்காடிப்பட்டி அஞ்சல், ஓரத்தநாடு வட்டம், தஞ்சாவூர் மாவட்டம் .

புதினம் - **சூல்** சோ. தர்மன் அடையாளம் பதிப்பகம் கருப்பூர் சாலை, புத்தாநந்தம் -

### அலகு-5

கட்டுரை

**-தமிழ்ச்சுடர்**

## பயன்கள்:

CO1 தமிழ்இலக்கியத்தின்மீதானஆர்வம்மிகும்.

CO2புதியஇலக்கியங்களைவடிவங்களைஅறிவார்.

CO3 கவிதை, சிறுகதை, நாவல்ஆகியவற்றைப்படைக்கமுயல்வார்.

CO4 நாடகத்தின்கூறுகளைகற்பார் .

CO5 கட்டுரையின்தனித்தன்மைகளைஅறிவார்.

## COURSE MAPPING

### 22ACCBL1- Ikkaala ilakkiyam

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL1.1	2	3	1	1	2
22ACCBL1.2	1	2	-	-	1
22ACCBL1.3	2	3	1	1	2
22ACCBL1.4	1	1	1	1	1
22ACCBL1.5	2	2	-	-	1
optimum	2	3	1	1	2



## நன்னூல் எழுத்ததிகாரம்

அலகு-1சிறப்புப் பாயிரம், பொதுப்பாயிரம்

அலகு-2எழுத்தியல்

அலகு-3பதவியல்

அலகு-4உயிரீற்றுப் புணரியல்

அலகு-5மெய்யீற்றுப் புணரியல், உருபு புணரியல்

### பயன்கள்:

- CO1 தமிழைப்பிழையின்றிஎழுதும்திறன்பெறுவர்.  
CO2 வல்லினம்மிகும்இடங்கள், மிகாஇடங்கள்அறிவர்.  
CO3 தமிழ்மொழிஇலக்கணத்தில்புலமைபெறுவர்.  
CO4 எழுத்துக்கள்பெறுகின்றபுணர்ச்சிநிலைகளைஅறிவர்.  
CO5 எழுத்திலக்கணத்தின்கூறுகள்பலவற்றையும்தெளிவுறக்கற்பர

## COURSE MAPPING 22ACCBL2-NANNOOL ELUTHATHIKARAM

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)  
If there is no correlation, put “ - ”

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL2.1	2	3	2	2	1
22ACCBL2.2	2	3	1	1	2
22ACCBL2.3	3	3	2	2	1
22ACCBL2.4	3	2	1	1	1
22ACCBL2.5	2	3	1	1	2
optimum	3	3	2	2	2



## தமிழ் இலக்கிய வரலாறு

### அலகு-1

சங்கம் பற்றிய செய்திகள் - முதல், இடை, கடைசச் சங்கங்கள் பற்றிய குறிப்புகள் - சங்க இலக்கியங்கள் - பத்துப்பாட்டும் எட்டுத் தொகையும்.

### அலகு-2

சங்கம் மருவிய கால இலக்கியங்கள் - பதினெண்கீழ்க்கணக்கு நூல்கள் - இரட்டைக் காப்பியங்கள் - முத்தொள்ளாயிரம்.

### அலகு-3

ஐம்பெருங்காப்பியங்கள் - ஐஞ்சிறுங்காப்பியங்கள் - கம்பராமாயணம் - பெரிய புராணம் - சீறாப்புராணம் - தேம்பாவணி.

### அலகு-4

பக்தி இலக்கியங்கள் - சிற்றிலக்கியங்கள் - பிள்ளைத்தமிழ், கலம்பகம், உலா, தூது, அந்தாதி, கோவை, குறவஞ்சி, பரணி, பள்ளு - தனிப்பாடல்கள்.

### அலகு-5

தற்கால இலக்கியங்கள் - மரபுக்கவிதை, புதுக்கவிதை - உரைநடை - சிறுகதை - புதினம் - நாடகம் - கட்டுரை இலக்கியம்.

### பயன்கள்:

CO1 தமிழ் இலக்கியங்கள் காலந்தோறும் தோன்றி வளர்ந்த வரலாற்றை அறிவர்.

CO2 இலக்கியங்களுக்கும் அரசியல் வரலாற்றுக்கும் இடையே உள்ள உறவை அறிவர்.

CO3 இலக்கிய நூல்களின் தோற்றக் காரணிகளை அறிந்து கொள்வர்.

CO4 தமிழின் தொன்மைக்கால இலக்கியங்கள் குறித்து புரிதலைப் பெறுவர்.

CO5 தமிழ் இலக்கியத்தின் பல்வேறுவகைகளையும், வடிவங்களையும் காலநிரலில் கற்பர்

## COURSE MAPPING

### 22AFACBL1 – TAMIL ILAKKIYAVARALARU

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22AFACBL1.1	2	3	-	-	-
22AFACBL1.2	1	1	1	1	2
22AFACBL1.3	-	2	2	2	1
22AFACBL1.4	-	2	2	2	2
22AFACBL1.5	1	1	-	-	1
optimum	2	3	2	2	2



## சிற்றிலக்கியம்

அலகு-1- விக் கிரம

சோழனுலா

அலகு-2- தக்கயாகப் பரணி

(காடு பாடியது, கோயில் பாடியது, களம்  
பாடியது)

அலகு-3- திருச்செந்தூர்ப் பிள்ளைத்தமிழ்

(பருவந்தோறும் முதல் ஐந்து பாடல்கள்)

அலகு-4- தமிழ்விடு தூது

(முழுமையும்)

அலகு-5- சடகோபர் அந்தாதி

### பயன்கள்:

CO1 தமிழ் இலக்கியங்களின் வளத்தினை அறிவர்.

CO2 தமிழ் இலக்கியங்களின் வகைகளை  
உணர்வர்.

CO3 சிற்றிலக்கியங்கள் வழி சமயம் சார்ந்த  
செய்திகளை அறிவர்.

CO4 சிற்றிலக்கியங்கள் வரலாற்று செய்திகளைப்  
பகரும் தன்மையை அறிவர்.

CO5 சிற்றிலக்கியங்கள் வெளிப்படுத்தும் இலக்கிய  
நுட்பங்களைக் கற்பர்.

## COURSE MAPPING

### 22ACCBL3-SITTRILKKIYUM

1: Slight (Low) 2: Moderate (Medium)3:  
Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL3.1	3	3	2	2	2
22ACCBL3.2	2	2	1	1	1
22ACCBL3..3	2	1	1	1	-
22ACCBL3..4	2	1	-	-	-
22ACCBL3..5	2	2	2	2	2
optimum	3	3	2	2	2





## நன்னூல் சொல்லதிகாரம்

அலகு1	- பெயரியல்
அலகு2	- வினையியல்
அலகு3	- பொதுவியல்
அலகு4	- இடையியல்
அலகு5	- உரியியல்

### பயன்கள்:

CO1 தமிழ்மொழியின் சொல் இலக்கணத்தை அறிவர்.

CO2 தமிழ்ச் சொற்களின் பயன்பாட்டை அறிவர்.

CO3 சொற்களின் வகைகளை இலக்கணநிலையில் இனங்காணும் அறிவை பெறுவர்.

CO4 மொழிநடையில் தேர்ச்சி பெறுவர்.

CO5 தமிழை பிழையின்றி பேசுகின்ற ஆற்றலை பெறுவர்.

## COURSE MAPPING

### 22ACCBL4- NANNOOL SOLLATHIKARAM

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL4.1	1	3	1	1	2
22ACCBL4.2	1	3	2	2	2
22ACCBL4.3	2	3	2	2	2
16LCCLT5.4	1	3	2	2	1
22ACCBL4.5	1	3	1	1	2
optimum	2	3	2	2	2



## தமிழக வரலாறும் மக்கள் பண்பாடும்

### அலகு-1

வரலாறு பற்றிய பொதுப்பாரண் வயும் வரலாறற்கு முற்பட்ட காலமும்- சங்ககாலம் - சங்கம் இருந்தமைக்கான சான்றுகள் - சங்ககாலஅரசுகள் - அரசியல்நிலை, சமுதாய நிலை, சமய நிலை - போர்முறை - கலைகள். அலகு-2

சங்கம் மருவிய காலம் - களப்பிரர் வருகையும் இருண்டகாலத் தமிழகமும் - பல்லவப் பேரரசர்கள் - பல்லவர் சாளுக்கியர் போர்கள் - பல்லவர் ஆட்சிமுறை, சமய நிலை,கலைக்குச் செய்த தொண்டு - முத்தரையர், சாதவாகனர்,வேளிர், இருக்கு வேளிர்.

### அலகு-3

சோழப்பேரரசின் தோற்றம் - சோழப் பேரரசர்கள் - சோழரின் வீழ்ச்சி - ஆட்சிமுறை - ஊராட்சி நிர்வாகம் - அரசியல், சமுதாய, சமய நிலை - சோழர்காலக் கலைகையும் திருக்கோயில் பணிகளும்.

### அலகு-4

பிற்காலப் பாண்டியர் எழுச்சி - மாலிக்கபூர் படையெடுப்பும் பாண்டியர் வீழ்ச்சியும் - தமிழகத்தில் முஸ்லீம் ஆதிக்கம் - விசயநகரத்தின் தோற்றம் - நாயக்க மன்னர்கள். பாளையப்பட்டு ஆட்சி முறையும் நாயக்கர் கால அரசியல் நிலையும் - நாயக்கர் கால சமயநிலை, கலைகள் - தமிழகத்தில் மராட்டியர் ஆட்சி.

### அலகு-5

ஆங்கிலேயர் ஆட்சியின் விளைவுகள் - இந்திய விடுதலைப்போரில் தமிழகத்தின் பங்கு - விடுதலைக்குப்பின் தமிழகம் பெற்றுள்ள வளர்ச்சி நிலைகள்.

### பயன்கள்:

CO1 தமிழ்ச்சமூகம், பண்பாடு, பொருளாதாரம் குறித்து வரலாற்று உணர்வைப் பெறுவர்.

CO2 தாய்மொழி மற்றும் தாய்நாட்டு உணர்வைப் பெறுவர்.

CO3 தமிழகத்தில் ஏற்பட்ட பண்பாட்டுப்படை எடுப்புகளை உணர்வர்.

CO4 தமிழகத்தில் நிகழ்ந்த வரலாற்றுச் சுவடுகளை தெளிவுறக் கற்பர்.

CO5 தமிழக அரசின் போட்டித் தேர்வுகளுக்கு அறிவூட்டம் பெறுவர்.

## COURSE MAPPING

### 22AFACBL2 – TAMILAGA VARALARUM MAKKAL PANBADUM

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22AFACBL2.1	3	3	2	2	3
22AFACBL2.2	3	3	2	2	2
22AFACBL2.3	2	2	3	3	2
22AFACBL2.4	3	3	2	3	1
22AFACBL2.5	2	2	3	3	3
optimum	3	3	3	3	3



## சமயஇலக்கியம்

அலகு-1 : - மூவர் தேவாரம்

1. திருஞானசம்பந்தர் தேவாரம் - திருநெடுங்களப் பதிகம்.  
'மறையுடையாய் தோலுடையாய்' எனத் தொடங்கும் பாடல் முதல் 11பாடல்கள்.
2. திருநாவுக்கரசர் தேவாரம் - திருவதிகைத் திருப்பதிகம்.  
'கூற்றாயினவாறு' எனத் தொடங்கும் பாடல் முதல் 10 பாடல்கள்.
3. சுந்தரமூர்த்தி தேவாரம் - திருப்புக்கொளியூர் அவினாசி பதிகம்.  
எற்றான் மறக்கேன்' எனத் தொடங்கும் பாடல் முதல் 10 பாடல்கள்.

அலகு -2 திருவாசகமும் திருவருட்பாவும்

1. திருவாசம் - திருக்கோத்தும்பி

'பூவேறு கோனும்'எனத்தொடங்கும் பாடல் முதல் 20 பாடல்கள்.

- 2.திருவருட்பா - இரண்டாம் பதிருமுறை - திருவருள் வேட்கை.

'மன்னமுதாம் உன்தாள்' எனத் தொடங்கும் பாடல் முதல் 10 பாடல்கள்.

அலகு -3 நாலாயிர திவ்வியப் பிரபந்தம்

- 1.பெரியாழ்வார் - திருப்பல்லாண்டு

'பல்லாண்டு பல்லாண்டு' எனத்தொடங்கும் பாடல் முதல் 12 பாடல்கள்.

- 2.தொண்டரடிப்பொடியாழ்வார் - திருப்பள்ளியெழுச்சி

'கதிரவன் குணதிசை' எனத் தொடங்கும் பாடல் முதல் 10 பாடல்கள்.

அலகு-4 இசுலாமிய இலக்கியம்

1. மஸ்தான் சாகிபு பாடல்கள்- நந்தீஸ்வரக் கண்ணி (51 கண்ணிகள்)

அலகு-5கிறித்தவ இலக்கியம்

- 1.கண்ணதாசனின் இயேசுகாவியம் - மலைப்பொழிவு (10 பாடல்கள்)

பயன்கள்:

CO1காலந்தோறும்பக்திஇலக்கியம்வளர்ந்துவந்துள்ளவரலாற்றைஅறிவர்.

CO2சைவ,வைணவசமயத்தின்பக்திநிலைகளையும்

சமயக்கோட்பாடுகளையும்உணர்வர்.

CO3 தமிழகத்தில் தோன்றிய சமயக்குரவர்களின்

வரலாற்று நிகழ்வை அறிவர்.

CO4 கிறிஸ்துவ, இசுலாமிய சமயத்தின் சமய நிலையை கற்பர்.

CO5 அனைத்துச் சமயங்களுக்கும் வலியுறுத்தும் மனிதம் ஒன்றே என்பதை உணர்வர்.

## COURSE MAPPING

### 22ACCBL5 - Smaya ilakkiyam

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL5.1	2	-	-	-	1
22ACCBL5.2	1	-	-	-	2
22ACCBL5.3	2	1	-	-	2
22ACCBL5.4	1	-	-	-	1
22ACCBL5.5	1	-	-	-	1
optimum	2	1	-	-	2



## நம்பியகப்பொருள் புறப்பொருள் வெண்பாமாலை

அலகு- 1 -நம்பியகப்பொருள் - பாயிரம், அகத்திணையியல்.

அலகு- 2 - நம்பியகப்பொருள் - ஒழிபியல்

அலகு- 3 - புறப்பொருள் வெண்பாமாலை - வெட்சி - கரந்தை  
- வஞ்சி

அலகு- 4 - புறப்பொருள் வெண்பாமாலை - காஞ்சி - நொச்சி -  
உழிஞை

அலகு- 5 - புறப்பொருள் வெண்பாமாலை - தும்பை - வாகை -  
பாடாண்

CO1 அகத்திணைகள் பற்றி அறிவர்.

CO2 உள்ளூறை, இறைச்சிபோன்ற உத்திநுட்பங்களைத் தெளிவர்.

CO3 புறத்திணைகள் பற்றிய அறிவைப் பெறுவர்.

CO4 தமிழில் அக, புற இலக்கண நூல்களின் வளத்தினைக்  
கற்பர்.

CO5 பழங்காலாக அகவாழ்க்கை, புறவாழ்க்கை  
நெறிகளை உணர்வர்.

## COURSE MAPPING

### 22ACCBL6–NAMBIYAKKAPPORUL PURAPPORUL

VENBAMALAI

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL6.1	1	3	-	-	-
22ACCBL6.2	-	2	-	-	1
22ACCBL6.3	1	3	-	-	1
22ACCBL6.4	1	3	-	-	1
22ACCBL6.5	2	3	-	-	1
optimum	2	3	-	-	1





## சுற்றுலாவியல்

அலகு-1

சுற்றுலா விளக்கம் - சுற்றுலாப் பயணிகள் - சுற்றுலா வகைகள் - உள்நாட்டுச் சுற்றுலா - சுற்றுலாவின் நோக்கங்கள் - காரணிகள் - அடிப்படைக் கூறுகள்.

அலகு-2

காலந்தோறும் சுற்றுலா வளர்ச்சி (பண்டைக்காலம், இடைக்காலம்) - தொழிற்புரட்சியும் சுற்றுலாவும் - நவீனகால சுற்றுலா வளர்ச்சி - உலக நாடுகள் - இந்தியா - தமிழ்நாடு - பன்னாட்டுப் பயணிகள் - சுற்றுலாப் பயணிகளின் வருகையும்பொருளாதாரமும்.

அலகு-3 சுற்றுலா திட்டமிடல் - விடுதிகளின் இன்றியமையாமை - சுற்றுலாக் கழகங்கள் - பயண முகவர்கள் - போக்குவரத்துச் சாதனங்கள்.

அலகு-4

சுற்றுலாவின் வணிகச் சந்தைகள் - வழிச்சந்தைகள் - வழிகாட்டிகள் - பயண நூல்கள் - பயண இலக்கிய வகைகள்.

அலகு-5

சுற்றுலாவின் முக்கியத்துவம் - நன்மைகள் - இந்தியா மற்றும் தமிழகத்தில் சுற்றுலா செல்வதற்கு உரிய இடங்கள்.

**பயன்கள்:**

**CO1**தமிழக சுற்றுலாத் தளங்கள் குறித்து அறிவைப் பெறுவர்.

**CO2** பயண இலக்கியங்கள் பற்றி அறிந்து கொள்வர்.

**CO3** சுற்றுலாவின் இன்றியமையாமையைக் கற்பர்.

**CO4** சுற்றுலாவினால் ஏற்படும்சந்தை,பொருளாதார அறிவைப் பெறுவர்.

**CO5** சுற்றுலா விடுதிகள் மற்றும் முகவர்கள் குறித்து அறிவர்

## 22ASACBL1–SUTRULAVIYAL

### COURSE MAPPING

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ASACBL1.1	1	1	1	1	1
22ASACBL1.2	1	1	1	1	1
22ASACBL1.3	1	1	1	1	1
22ASACBL1.4	2	1	2	1	2
22ASACBL1.5	1	2	2	2	1
optimum	2	2	2	2	2



## காப்பியம்

அலகு -1 - சிலப்பதிகாரம் (10 காதைகள்)

புகார் காண்டம் முழுமையும்.

அலகு -2 - மணிமேகலை (08 காதைகள்)

(பாத்திரம் பெற்ற காதை முதல் உதயகுமரன் அம்பலம் புக்க காதை வரை)

அலகு -3 - சீவக சிந்தாமணி

சுரமஞ்சரியார் இலம்பகம்.

அலகு -4- கம்பராமாயணம்

யுத்த காண்டம் - கும்பகர்ண வதைப்படலம்

அலகு -5 - 1. பெரியபுராணம் - மூர்த்தி நாயனார் புராணம்

2. பெருங்கதை - மகத காண்டம்

### பயன்கள்:

CO1 காப்பிய இலக்கியத்தின் சிறப்புகளை அறிவர்.

CO2 காப்பியக்கதைகள் வழி அறச்சிந்தனைகளைப் பெறுவர்.

CO3 பல்வேறு காப்பிய வடிவங்களை பற்றிய அறிவைப் பெறுவர்,

CO4தமிழ் இலக்கிய வரலாற்றில் காப்பியங்களின் படிநிலைகளை உணர்வர்.

CO5தமிழ் காப்பியங்களின் கொள்கைகளையும் இலக்கியச் சுவைகளையும் கற்பர்.

**COURSE MAPPING**  
**22ACCBL7 - KAPPIYUM**

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
<b>22ACCBL7.1</b>	2	1	2	2	2
<b>22ACCBL7.2</b>	2	2	2	2	2
<b>22ACCBL7.3</b>	2	2	2	2	3
<b>22ACCBL7.4</b>	2	2	2	2	3
<b>22ACCBL7.5</b>	3	2	2	2	3
optimum	3	2	2	2	3



## தொல்காப்பியம் எழுத்ததிகாரம் (இளம்பூரணம்)

அலகு1 - நூன்மரபு, மொழிமரபு

அலகு2 - பிறப்பியல், புணரியல்

அலகு3 - தொகைமரபு, உருபியல்

அலகு4 - உயிர்மயங்கியல், புள்ளி மயங்கியல்

அலகு5 - குற்றியலுகரப் புணரியல்

### பயன்கள்:

**CO1** தமிழைப் பிழையின்றி எழுதும் திறனும் புலமையும் பெறுவர்.

**CO2** தமிழ் எழுத்துக்களின் பிறப்பு முறைகளையும் உச்சரிப்பு நிலைகளையும் கற்பர்.

**CO3** வல்லினம் மிகும் மிகா இடங்களை அறிவர்.

**CO4** எழுத்துக்கள் பெறுகின்ற புணர்ச்சி நிலைகளை அறிவர்.

**CO5** எழுத்திலக்கணத்தின் கூறுகள் பலவற்றையும் தெளிவுறக்கற்பர்.

## COURSE MAPPING

**22ACCBL8 –தொல்காப்பியம் எழுத்ததிகாரம் (இளம்பூரணம்)**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL8 .1	2	1	-	-	1
22ACCBL8 ..2	2	2	-	-	1
22ACCBL8. .3	2	2	-	-	-
22ACCBL8 ..4	2	2	-	-	-
22ACCBL8..5	2	2	-	-	1
OPTIMUM	2	2	-	-	1



## தமிழகக் கோயில் கலையும் நிர்வாகமும்

### அலகு-1

சங்க இலக்கியங்கள்வழி அறியலாகும் கோயில்கள் - இரட்டைக் காப்பியங்கள் கூறும் கோயில்கள் - பல்லவர் காலக் கோயில் வகைகள் - மகேந்திரவர்மன், நரசிம்மவர்மன், இராசசிம்மன் ஆகியோரின் கோயில் பணிகள் - அகழ்வாராய்ச்சியில் கிடைத்திருக்கும் கோயில் தொடர்பான செய்திகள்.

### அலகு-2

சோழர்காலக் கோயில்களின் அமைப்பும் சிறப்பும் - தஞ்சைப் பெருவுடையார் கோயில் - கங்கைகொண்ட சோழபுரம் கோயில் - தாராசுரம் கோயில் - இவற்றின் தனிச்சிறப்புகள்.

### அலகு-3

மதுரை மீனாட்சியம்மன் கோயில் - திரவரங்கக் கோயில் - காளையார் கோயில் - தேவாரத் திருத்தலங்கள் - வைணவத் திருத்தலங்கள் - தமிழகக் கோயில்களில் மூர்த்தி, தலம், தீர்த்தம் என்னும் முச்சிறப்புகள்.

### அலகு-4

தொல்பொருள் துறையின் செயல்பாடுகளும் அதிகார வரம்புகளும் - அறநிலையத் துறையின் செயல்பாடுகளும் அதிகார வரம்புகளும் - திருக்கோயில்களில் அன்றாட வழிபாட்டு முறைகள் - கோயில் திருவிழாக்கள் - திருக்குடமுழுக்கு - தனியார் கோயில்கள் பற்றிய செய்திகள்.

### அலகு-5

அறநிலையச் சட்டங்கள் - தக்கார், அறங்காவலர் முதலான பொறுப்புகள் - கோயில் நிர்வாக முறைகள் - கோயில் சொத்து விவரங்கள் - வரவும் செலவும் தணிக்கை முறைகளும் - பொது நன்மைக்குத் திருகோயில் நிதி.

பயன்கள்:

CO1 பழந்தமிழரின் கட்டடக்கலை அறிவைத் தெளிவர் .

CO2 தமிழக மன்னர்களின் பல்வேறுபட்ட கோயிற்கலை நுணுக்கங்களை அறிவர் .

CO3 தொல்பொருள்துறை அறநிலையத்துறையின் செயல்பாடுகள்  
பொறுப்புகளைக் கற்பர்.

CO4 கோயில் நிர்வாகக்கலை பற்றி அறிவர்.

CO5 அரசுப்பணி வாய்ப்புகளில் முன்னுரிமை பெறுவர்.

## COURSE MAPPING

22ASACBL2 - தமிழகக் கோயில் கலையும் நிர்வாகமும்

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ASACBL2.1	1	2	3	1	1
22ASACBL2 ..2	3	3	1	1	1
22ASACBL2.3	1	2	1	1	1
22ASACBL2..4	1	3	1	2	1
22ASACBL25	3	1	1	3	1
OPTIMUM	3	3	3	3	1





அற இலக்கியம் (திருக்குறள் நீங்கலாக)

அலகு-1

1. நாலடியார்

1. அறன் வலியுறுத்தல் (10 பாடல்கள்)
2. நல்லினம் சேர்தல் (10 பாடல்கள்)

2. பழமொழி நானூறு

1. கல்வி (10 பாடல்கள்)

அலகு-2

1. சிறுபஞ்சமூலம்

- 1 முதல் 20 பாடல்கள் வரை (20 பாடல்கள்)

2. நான்மணிக்கடிகை

- 11 முதல் 20 பாடல்கள் வரை (10 பாடல்கள்)

அலகு-31. முதுமொழிக்காஞ்சி (முழுமையும்)

2. இன்னா நாற்பது

- 11 முதல் 20 பாடல்கள் வரை (10 பாடல்கள்)

அலகு-41. திரிகடுகம்

- 41 முதல் 60 பாடல்கள் வரை (20 பாடல்கள்)

2. ஏலாதி

- 01 முதல் 10 பாடல்கள் வரை (10 பாடல்கள்)

அலகு-5

1. நீதிநெறி விளக்கம்

- 31 முதல் 40 பாடல்கள் வரை (10 பாடல்கள்)

1. முதுரை (முழுமையும்)

பயன்கள்:

CO1 தமிழ்மொழியின் அறஇலக்கியங்கள் பற்றிய அறிவினை பெறுவர்.

CO2 தனிமனித வாழ்வியலுக்கான அடிப்படை அறங்களைக் கற்பர்.

CO3 சமூகவாழ்வியலுக்கான பொறுப்பு நிலைகளை உணர்வர்.

CO4 இலக்கியங்கள் வெளிப்படுத்தும் சமூகப் பொறுப்புணர்ச்சியை அறிவர்.

CO5 அறஇலக்கியங்கள் உணர்த்தும் சமூக, அரசியல்பரிமாணங்களைகற்பர்.

## .COURSE MAPPING

### 22ACCBL9-

அற இலக்கியம் (திருக்குறள் நீங்கலாக)

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL9.1	2	3	3	2	3
22ACCBL9 ..2	3	3	3	3	3
22ACCBL9. .3	3	3	2	2	3
22ACCBL9 ..4	3	3	3	3	3
22ACCBL9..5	3	3	3	2	3
OPTIMUM	3	3	3	3	3



## ஒப்பிலக்கியம்

அலகு-1

ஒப்பீடும் ஒப்பிலக்கியமும் - ஒப்பிலக்கியக் கொள்கைகள் - ஒப்பிலக்கியத்தின் தோற்றமும் வளர்ச்சியும் - தமிழில் ஒப்பிலக்கியத்தின் வளர்ச்சி.

அலகு-2

நால்வகை இலக்கியம் - பிற இலக்கியத் தாக்கம் - இலக்கியமும் கலைகளும் - தொன்மங்கள் - இலக்கிய வகைப்பாட்டு முறைகள் - அறிவியல் நோக்கில் இலக்கிய வளர்ச்சி -

அலகு-3

தொல்காப்பியமும் வடமொழி இலக்கியக் கொள்கைகளும் - மெய்ப்பாடும் இரசகே காட்பாடும் - உள்ளுறை உவமம், இறைச்சி - வண்ணமும் வனப்பும்.

அலகு-4

தமிழ் கிரேக்க வீரநிலைக்காலப் பாடல்கள் - திருவள்ளுவரும் ஹீசியடும் - திருவள்ளுவரும் கன்பூசியசும் - திருவள்ளுவரும் பருத்ருஹரியும்.

அலகு-5

கம்பனும் வால்மீகியும் - பாரதியும் விடமனும் - இளங்கோவும் ஷேக்ஸ்பியரும் - இந்திய இலக்கிய வகைகள்.

**பயன்கள்:**

**CO1** ஒப்பிலக்கியம் குறித்து அறிவைப் பெறுவர்.

**CO2** இலக்கியவகைகளில் உள்ள கருத்தியல்புகளை அறிவர்.

**CO3** காலந்தோறும் வளர்ந்துள்ள இலக்கியங்களின் வடிவம் பொருண்மைகளை ஒப்பிடுவர்.

**CO4** பல்வேறு இலக்கியங்களுக்குள் இருக்கும் வாழ்வியல் விழுமியங்களை கற்பர்.

**CO5** இலக்கியங்களை ஒப்பிடுவதன் வாயிலாக தாய்மொழி இலக்கியத்தின் சிறப்பினை திறனாய்வு செய்வர்.

## COURSE MAPPING

### 22ACCBL10- ஒப்பிலக்கியம்

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL10.1	2	3	3	3	2
22ACCBL10.2	3	3	2	2	3
22ACCBL10.3	3	3	3	3	3
22ACCBL10.4	3	3	3	3	3
22ACCBL10.5	2	3	2	2	3
OPTIMUM	3	3	3	3	3



## யாப்பருங்கலக்காரிகை தண்டியலங்காரம்

அலகு-1: எழுத்து, அசை, சீர், தளை, அடி, தொடை

அலகு-2: வெண்பா, அகவற்பா, கலிப்பா, வஞ்சிப்பா, மருட்பா

அலகு-3: தன்மையணி, உவமையணி, உருவகவணி

அலகு-4: தீவக அணி, வேற்றுப் பொருள் வைப்பணி, ஒட்டணி, தற்குறிப்பேற்ற அணி, ஏது அணி,

அலகு-5: இலேசவணி, நிரல்நிறை அணி, சுவையணி, தன்மேம்பாட்டு ரையணி, ஒப்புமைக்கூட்ட வணி, வாழ்த்தணி

### பயன்கள்:

CO1 தமிழ் இலக்கிய பாடல்களின் செய்யுள் உறுப்பு முறைகளை அறிவர்.

CO2 பாக்களின் வகைகளையும் இனங்களையும் தெளிவுற கற்பர்.

CO3 தமிழ் இலக்கிய வரலாற்றில் அணி இலக்கணமரபை தெளிவர்.

CO4 அணிகளின் நுட்பமான வேறுபாடுகளை அறிவர்.

CO5 இலக்கியங்களில் கையாளப்பட்டிருக்கும் அணிகளின் வகைகளையும் சுவைகளை கற்பர்.

## COURSE MAPPING 22ACCBL11

யாப்பருங்கலக்காரிகை தண்டியலங்காரம்

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL11.1	3	3	3	3	3
22ACCBL11.2	3	3	3	3	3
22ACCBL11.3	3	3	3	3	3
22ACCBL11.4	3	3	3	3	3
22ACCBL11.5	3	3	3	3	3
OPTIMUM	3	3	3	3	3



## தொல்காப்பியம் சொல்லதிகாரம் (இளம்பூரணம்)

அலகு-1: கிளவியாக்கம்

அலகு-2: வேற்றுமையியல், வேற்றுமை மயங்கியல்

அலகு-3: விளிமரபு, பெயரியல்

அலகு-4: வினையியல், இடையியல்

அலகு-5: உரியியல், எச்சவியல்

### பயன்கள்:

**CO1** தமிழ்மொழியின் சொல்லிலக்கணத்தை அறிவர்.

**CO2** தமிழ் சொற்றொடர்களை தவறின்றி அறியும் திறன் பெறுவர்.

**CO3** தமிழ் சொற்களின் பயன்பாட்டை அறிந்து மொழிநடையில் தேர்ச்சி பெறுவர்.

**CO4** சொற்களின் வகைகளை இலக்கண நிலையில் இனங்காணும் அறிவை பெறுவர்.

**CO5** தமிழைப் பிழையின்றி பேசுகின்ற ஆற்றலை பெறுவர்.

## COURSE MAPPING

### 22ACCBL12- தொல்காப்பியம் சொல்லதிகாரம் (இளம்பூரணம்)

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL12.1	3	3	3	3	3
22ACCBL12.2	3	3	3	3	3
22ACCBL12.3	3	3	3	3	3
22ACCBL12.4	3	3	3	3	3
22ACCBL12.5	3	3	3	3	3
OPTIMUM	3	3	3	3	3





## 1. நாட்டுப்புற இலக்கியம்

அலகு-1 - நாட்டுப்புறவியல் அறிமுகம்

நாட்டுப்புறவியல் சொல் விளக்கம் - நாட்டுப்புறவியல் தறை வளர்ந்த வரலாறு - பழந்தமிழ் இலக்கியங்களில் நாட்டுப்புற வழக்காறுகளின் செல்வாக்கு - நாட்டுப்புற இலக்கியங்கள் - வரையறை - கதைகள் - பாடல்கள் - கதைப்பாடல்கள் - பழமொழிகள் - விடுகதைகள் ஆகியவற்றின் அடிப்படைப் பண்புகள்.

அலகு-2 - நாட்டுப்புறக் கதைகள்

நாட்டுப்புறக் கதைகள் - நாட்டுப்புறக் கதைகளின் வகைப்பாடு - கதைகளின் நோக்கம் - அமைப்பு - தொடக்கம் - முடிவு - அறம் கூறுதல் போன்றவை - சிறுவர் கதைகள் - புராணக் கதைகள் - பறவைகள், விலங்குகள் தொடர்பான கதைகள் - சமூகக் கதைகள் - கதைகள் காட்டு ம் நம்பிக்கை, பழக்க வழக்கங்கள் - உளவியல் சிந்தனைகள் ஆகியன.

அலகு-3 - நாட்டுப்புறப் பாடல்கள்

நாட்டுப்புறப் பாடல்கள் - நாட்டுப்புறப் பாடல் வகைப்பாடு - தாலாட்டு ப் பாடல்கள் - குழந்தைப் பாடல்கள் - எண்ணுப்பயிற்சிப் பாடல்கள் - காதல் பாடல்கள் - தொழிற்பாடல்கள் - கொண்டாட்டப் பாடல்கள் - வழிபாட்டு ப் பாடல்கள் - ஒப்பாரிப் பாடல்கள் - நாட்டுப்புறப் பாடல்கள் காட்டும் சமூகநிலை.

அலகு-4 - நாட்டுப்புறக் கதைப்பாடல்கள்

கதைப்பாடல்கள் அறிமுகம் - கதைப்பாடல்களின் தன்மையும் அமைப்பும் - வகைகள் - வராற்றுக் கதைப்பாடல்கள் - சமூகக் கதைப்பாடல்கள் - புராண, இதிகாசக் கதைப்பாடல்கள் - கதைப்பாடல்களின் மொழிநடை - கதைப்பாடல்களில் சமூகநிலை.

அலகு-5 - நாட்டுப்புறப் பழமொழிகள், விடுகதைகள்

பழமொழிகள் - பழமொழியும் தமிழ் இலக்கியங்களும் - பழமொழி வகைப்பாடு - பழமொழியின் தன்மை - பழமொழியின் அமைப்பு - பழமொழியின் கருப்பொருள் - பழமொழியால் அறியலாகும் செய்திகள் - விடுகதைகள் - விடுகதைகளின் வகைகள் - விடுகதைசூழ் முல் - விடுகதைகளின் கருப்பொருள் - விடுகதைகளின் நடை - விடுகதைகளால் அறியலாகும் செய்திகள்.

பயன்கள்:

CO1 நாட்டுப்புற இலக்கியங்களின் தனித்தன்மைகளையும் சிறப்புகளையும் உணர்வர்.

CO2 நாட்டுப்புற இலக்கியங்களின் வழிமக்களின் வாழ்வியலை அறிவர்.

CO3 தமிழ் சமூகத்தின் தொன்று தொட்ட மரபுகளைத் தெளிவர்.

CO4 நாட்டுப்புற இலக்கியம் மூலம் வரலாற்றுச் செய்திகளை கற்பர்.

CO5 நாட்டுப்புற இலக்கியங்களில் ஆய்வு செய்யும் ஆர்வம் பெறுவர்.

## COURSE MAPPING

### 1. 22AMBEBL1 - நாட்டுப்புற இலக்கியம்

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
<b>22AMBEBL1.1</b>	3	3	3	3	1
<b>22AMBEBL1.2</b>	3	2	3	3	-
<b>22AMBEBL1.3</b>	3	3	2	2	1
<b>22AMBEBL1.4</b>	3	2	3	3	1
<b>22AMBEBL1.5</b>	3	-	2	2	-
OPTIMUM	3	3	3	3	1



## சங்க இலக்கியம்

அலகு-1 - பட்டினப்பாலை (முழுமையும்)

அலகு-2.நற்றிணை

1 முதல் 10 பாடல்கள் வரை (10 பாடல்கள்) குறுந்தொகை

131 முதல் 150 பாடல்கள் வரை (20 பாடல்கள்) 2.ஐங்குறுநூறு

நெய்தல் திணை - தோழிக்கு உரைத்த பத்து (10 பாடல்கள்)

அலகு-3 - 1. அகநானூறு - மணிமிடை பவளம் 171 முதல் 180 பாடல்கள் வரை (10

பாடல்கள்) 2. கலித்தொகை - பாலைக்கலி 2 முதல் 10 பாடல்கள் வரை (9

பாடல்கள்) 3. பரிபாடல் திருமால் - 13 ஆம் பாடல் (1 பாடல்)

அலகு-4 - புறநானூறு 127 முதல் 150 பாடல்கள் வரை (24 பாடல்கள்)

அலகு-5 - பதிற்றுப்பத்து ஆறாம் பத்து (10 பாடல்கள்)

### பயன்கள்:

CO1 பழந்தமிழ் இலக்கிய மரபை அறிவார்.

CO2 சங்க இலக்கியங்களில் உள்ள அழகியல் கூறுகளை உணர்வார்.

CO3 பழந் தமிழர்களின் வாழ்வியல் அறங்கள் முறைகளை அறிவார்.

CO4 பழந் தமிழர்களின் வாழ்வியல் அறங்கள் முறைகளை அறிவார்.

CO5 தமிழ் இலக்கிய வரலாற்றில் பண்டைய தமிழ் இலக்கியங்களின்

தனித்தன்மைகளை அறிவார்.

## COURSE MAPPING

### 22ACCBL13-சங்க இலக்கியம்

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
<b>22ACCBL13.2</b>	3	3	3	3	2
<b>22ACCBL13.2</b>	3	3	2	2	1
<b>22ACCBL13.3</b>	3	2	2	2	1
<b>22ACCBL13.4</b>	2	2	2	1	1
<b>22ACCBL13.5</b>	3	3	3	2	1
OPTIMUM	3	3	3	3	2



## திருக்குறள்

அலகு-1

திருக்குறள் நூலமைப்பு - அதிகாரப் பகுப்புமுறை - திருக்குறள் உணர்த்தும் வாழ்வியல் விழுமியங்கள் - அழகியல் கூறுகள் - அணிநலன்கள் - திருக்குறள் குறித்து ஜி.யு.போப், ஆல்பர்ட், எல்லீஸ் போன்ற அறிஞர்களின் கருத்துக்கள் - சமஸ்கிருத, இலத்தீன், கிரேக்க நீதி நூல்களுடன் ஒப்பிடல் - திருக்குறளின் உயர்வு சிறப்பும்.

அலகு-2 - கடவுள் வாழ்த்து - பிறனில் விழையாமை (15 அதிகாரங்கள்)

அலகு-3 - இறைமாட்சி - சுற்றந்தழால் (15 அதிகாரங்கள்)

அலகு-4 - வினைசெயல் வகை - தீ நட்பு (15 அதிகாரங்கள்)

அலகு-5 - சூது - பண்புடைமை (7 அதிகாரங்கள்) |  
புணர்ச்சி மகிழ்தல் - கண் விதுப்பழிதல் (8 அதிகாரங்கள்)  
(மொத்தம் 15 அதிகாரங்கள்)

**பயன்கள்:**

**CO1** தனி மனித சமுதாய வாழ்விற்கான அற உணர்வினைப் பெறுவர்.

**CO2** திருக்குறளில் அமைந்துள்ள இலக்கிய அழகியலை உணர்வர்.

**CO3** திருக்குறளின் காலம் கடந்து நிற்கும் திறத்தினை தெளிவர்.

**CO4** திருக்குறள் உணர்த்தும் அகப்பொருள் தன்மையை அறிவர்.

**CO5** அறஇலக்கியங்கள் வழிமனிதவிழுமியங்களை கற்பர்.

## COURSE MAPPING

### 22ACCBL14- திருக்குறள்

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL14.1	3	1	2	2	3
22ACCBL14.2	3	3	3	3	2
22ACCBL14.3	3	2	2	1	1
22ACCBL14.4	2	2	2	1	1
22ACCBL14.5	2	2	2	1	1
OPTIMUM	3	3	3	3	3



**தொல்காப்பியம் பொருளதிகாரம் (இளம்பூரணம்)**  
**(செய்யுளியல் நீங்கலாக)**

அலகு-1 - அகத்திணையியல்

அலகு-2 - புறத்திணையியல்

அலகு-3 - களவியல், கற்பியல்

அலகு-4 - பொருளியல், மெய்ப்பாடல் யல்

அலகு-5 - உவமையியல், மரபியல்

**பயன்கள்:**

**CO1** தமிழ்மொழியின் சொல் இலக்கணத்தை அறிவர்.

**CO2** தமிழ்சொற்றொடர்களை தவறின்றி அறியும் திறன் பெறுவர்.

**CO3** தமிழ்சொற்களின் பயன்பாட்டை அறிந்துமொழிநடையில் தேர்ச்சி பெறுவர்.

**CO4** சொற்களின் வகைகளை இலக்கணநிலையில் இனங்காணும் அறிவை பெறுவர்.

**CO5** தமிழைப் பிழையின்றி பேசுகின்ற ஆற்றலை பெறுவர்.

## COURSE MAPPING

### 22ACCBL15-

தொல்காப்பியம் பொருளதிகாரம் (இளம்பூரணம்)  
(செய்யுளியல் நீங்கலாக)

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22ACCBL15.1	3	3	2	2	2
22ACCBL15.2	2	3	2	2	2
22ACCBL15.3	3	3	2	2	2
22ACCBL15.4	3	3	2	2	2
22ACCBL15.5	3	3	2	2	2
OPTIMUM	3	3	2	2	2





## 1. கல்வெட்டியல்

அலகு-1

பண்டையக் குறியீடுகளும், எழுத்துகளும் - பூலங்குறிச்சி கல்வெட்டு எழுத்துக்கள் - தமிழ்நாட்டு எழுத்து முறைகளின் வளர்ச்சி - தமிழ்க் கல்வெட்டு கண்டுபிடிப்புகள்.

அலகு-2

கல்வெட்டுகளும் இலக்கியமும் - தமிழ்க் கல்வெட்டு களும் வரலாறும் - செப்பேடுகள் - பதிப்பித்தலில் அணுகுமுறை - மெய்க்கீர்த்தி - ஓலையும் கல்வெட்டும்.

அலகு-3

சோழர் காலத்திய ஆவணப் பதிவு முறைகள் - சில அரிய சொற்கள் - ஆள் பெயர்கள் காட்டும் சமுதாயம் - மாராயமும் மாராயனும் - வைத்திய குலம்.

அலகு-4

கல்வெட்டில் இந்து, முஸ்லீம் சமய ஒருமைப்பாடு - சேலம் மாவட்டக் கல்வெட்டுகள் - விடுகாதழகிய பெருமாள் - எழுத்துப் பொறிப்புப் பெற்ற தீர்த்தங்கரர் திருமேனி - அழுந்தாரும் அழுந்தியும்.

அலகு-5

தொண்டியில் ஒரு புதிய கல்வெட்டு - வரலாற்று நோக்கில் நாகப்பட்டினம் - தஞ்சை மராட்டியர் கல்வெட்டு களும் செப்பேடுகளும் - ஓலை ஆவணங்களும் முத்திரை ஓலைகளும்.

**பயன்கள்:**

**CO1** தமிழ்மொழியின் பண்பாட்டின் தொன்மைபெருமையை அறிவர்.

**CO2** தமிழ்மொழியின் இனத்தின் வரலாற்றை உணர்வர்.

**CO3** பழந்தமிழ் எழுத்து முறைகளை அறிவர்.

**CO4** பண்டைய கல்வெட்டுகள் பற்றிய தெளிவை பெறுவர்.

**CO5** கல்வெட்டுக்கள் உணர்த்தும் பல்வேறு செய்திகளை வரலாறுகளை அறிவர்.

## COURSE MAPPING

### 22AMBEBL3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
22AMBEBL3.1	3	3	3	3	2
22AMBEBL3.2	3	2	2	2	3
22AMBEBL3.3	1	3	2	2	3
22AMBEBL3.4	2	3	3	3	2
22AMBEBL3.5	3	3	2	2	2
OPTIMUM	3	3	3	3	3



## இதழியல்

அலகு-1: இதழியல் - இயல்பும் பரப்பும்:

இதழியல் விளக்கமும் இலக்கணமும் - இதழியல் நோக்கம், பணிகள், கடமைகள் - இதழ்களின் வகைகளும் இயல்புகளும் - மக்களாட்சியில் இதழ்களின் பணிகள் - இதழ்களின் சுதந்திரம் - இதழியலாளர்களின் தகுதிகளும் திறமைகளும்.

அலகு-2: இதழியல் தோற்றமும் வளர்ச்சியும்:

இதழியல் வளர்ச்சி வரலாறு - தமிழகத்தில் இதழியல் வளர்ச்சி - விடுதலை இயக்க காலத்தில் தமிழ் இதழ்கள் - தற்காலத் தமிழ் இதழ்கள்.

அலகு-3:பத்திரிகைச் சட்டங்களும் இதழ்கள் தொடங்கும் வழிமுறைகளும் :20 மணி

பத்திரிகைச் சட்டங்கள் - பத்திரிகை மன்றம் - இதழ்கள் தொடங்குவதற்குரிய வழிமுறைகள் - செய்தித்தாள் நிர்வாக அமைப்பு.

அலகு-4:செய்திகள் - சேகரித்தல், எழுதுதல்:

செய்தியாளர் - பணிகள், பண்புகள், கருவிகள், அடிப்படை விதிகள் - செய்தியின் விளக்கம், இயல்பு, வகைகள், மூலங்கள் - செய்தியின் உள்ளடக்கங்கள் - செய்தி நிறுவனங்கள் - பேட்டி - பல்வேறு வகையானசெய்திகள் - படங்களும் இதழ்களும்.

அலகு-5:

செய்திகளைப் பதிப்பித்தல்:

செய்திகளைச் செப்பனிடுதல் - ஆசிரியர் - செய்தி ஆசிரியர் - துணையாசிரியர் - செய்திகயின் கட்டமைப்பு - பக்க வடிவமைப்பு - அச்சுப்படி திருத்துதல் - இதழியல் மொழிநடை - தலையங்கள்.

**பயன்கள்:**

**CO1** செய்திகள் குறித்து அறிவைப் பெறுவர்.

**CO2** செய்திகளைத் திரட்டும் முறைமைகளை மாணவர்கள் அறிவர்.

**CO3** இதழியலின் சட்டங்களை மாணவர்கள் தெளிவுறக் கற்பர்.

**CO4** செய்திகளைப் பதிப்பிக்கும் நுட்பங்களை உணர்வர்.

**CO5** மாணவர்கள் செய்திகளை வாசிக்கும் பழக்கத்திற்கு உள்ளாகுவர்.

## **.COURSE MAPPING**

### **22ASBEBL2-இதழியல்**

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO CO	PO1	PO2	PO3	PO4	PO5
<b>22ASBEBL2.1</b>	2	2	3	3	-
<b>22ASBEBL2.2</b>	2	1	3	3	-
<b>22ASBEBL2.3</b>	2	2	3	3	1
<b>22ASBEBL2.4</b>	2	2	2	2	-
<b>22ASBEBL2.5</b>	2	1	2	2	1
<b>22ASBEBL2.6</b>	3	2	1	1	-
<b>OPTIMUM</b>	3	2	3	3	1





**DEPARTMENT OF TAMIL**  
**PG-2022-2023**  
**PO,PSO,CO,MAPPING**

**PROGRAMME OBJECTIVES:**

1. Opportunity to learn the periodical changes in Tamil Poetry.
2. Ability to distinguish the creative works of various short story authors and their creativeness and technique.
3. Learning science of language letters and their phonetics.
4. Techniques of analyzing language can be learned.
- . Opportunity to develop and gain knowledge by comparing literature with very many arts.
6. Connection of epical structures and internal similarity of Silapthikaram and Manimekalai will be learnt.
7. Classification forms of Tamil Minor Literature will be learned
8. Able to learn the growth of Tamils in various Eras.
9. Dependence of classification of classical society, life style of Classical People and their ethics on regional nature.
10. Demonstrate the knowledge on the importance of media communication.

**PROGRAMME OUTCOMES:**

1. Ability to get cleared in competitive skills like IAS, IPS, TNPSC examination, TET, NET & SET etc.,
2. Job opportunities in cine Industries.
3. Better Opportunities in Translating work.
4. Job Opportunities in Press and Tele Media
5. M. A graduation are eligible to work in various Journal publication industries, like editorial, Proof reading etc.,.
6. They are eligible for various higher education courses like M. Phil, Ph.D., Archaeology etc.
7. Employability in Translation and comparative literature fields.
8. Understand the usage of reference works.

## PROGRAMME SPECIFIC OUTCOMES:

1. Jobs in comparative Literature departments.
2. Jobs in abroad where Tamil is one of the official Languages.
3. Ability to work in Translation and Tran's literature department.
4. Enriched with Tamil Traditional grammar.
5. Knowledge in Tamil Tradition, Culture and arts.
6. Ability to compare Sangam Classics, and Epic Literature with the literature of other cultures and other continents
7. Approach Tamil language on the philological base.
8. Understand the life of Ancient Tamil associated with nature.

## இக்கால இலக்கியம்

அலகு 1.

1. கவிதை
2. மரபுக்கவிதை
1. பாரதியார் - கண்ணன் பாட்டு
2. பாரதிதாசன் - எதிர்பாராத முத்தம்  
(முதற் பகுதி, இரண்டாம் பகுதி)
2. புதுக்கவிதை
1. அப்துல் ரகுமான் - தேவகானம்
2. மீரா - ஊசிகள்

அலகு 2. சிறுகதை

1. வெ. இறையன்பு - நின்னினும் நல்லன்
2. சரத்சந்திரர் - என் இளம்பிராயக் கதைகள்

அலகு 3. புதினம்

1. ஜெயகாந்தன் - உனல் னப்போல் ஒருவன்
2. தோப்பில் முஹம்மது மீரான் - அஞ்சுவண்ணம் தெரு
3. கு.வெ. பாலசுப்பிரமணியம் - வயல்

அலகு 4. நாடகம்

1. பெ. தூரன் - ஆதி அத்தி
2. கு.சா. கிர்ஷ்ணமுர்த்தி - கலைவாணன்
3. நா. பாரத்தசாரதி - கபாடபுரம்

அலகு 5. உரைநடை

1. டாக்டர் எம்.எஸ். உதயமுர்த்தி - உயர் மனிதனை உருவாக்கும் எண்ணங்கள்
2. நா. முத்துக்குமார் - அணிலாடும் முனறில்



## COURSE OUTCOME

- தமிழ்க் கவிதையில் காலந்தோறும் ஏற்பட்ட அக, புற மாற்றங்களைக் கற்றறிவர்
- மரபுக்கவிஞர்களின் படைப்பாற்றலையும் தனித்தன்மைகளையும் ஆய்ந்தறிவர்..
- புதுக்கவிதையின் அமைப்பு, வகைமைகளைக் கற்றுணர்வர்.
- தமிழ் நாடக இலக்கியத்தின் போக்கு, தனித்தன்மைகளைக் கற்பர்.
- சிறுகதைப் படைப்புகளின் உருவ, உள்ளடக்க வேறுபாடுகளை இனங்காண்பர்.
- தமிழ்ப் புதினங்களின் பாடுபொருள், போக்குகள் குறித்துப் பகுத்தாய்வுர்.
- உரைநடை இலக்கியத்தின் நடைச் சிறப்பு, தனித்தன்மைகளைக் கற்றறிவர்

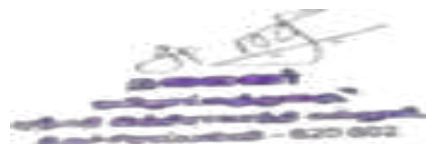
## COURSE MAPPING

### P22TA11- Ikkaala ilakkiyam

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	3	3	3	3	3	2	2
CO2	3	3	3	3	3	2	2	2
CO3	3	3	2	3	3	3	2	2
CO4	3	2	3	2	3	2	3	3
CO5	3	3	3	2	3	3	3	3
CO6	3	3	2	3	3	3	3	3
CO7	3	2	3	3	3	2	3	3
Average	3	3	3	3	3	3	3	3



## சிற்றிலக்கியம்

அலகு 1. அந்தாதி

1. அதிவீரராம பாண்டி யர் - திருக்கருவைப் பதிற்றுப்பத்தந்தாதி

2. அபிராமிப் பட்டர் - அபிராமி அந்தாதி

அலகு 2. மாலை

1. திரிகூடராசப்பக் கவிராயர் - திருக்குற்றால மாலை

அலகு 3. சதகம்

1. அம்பலவாணக் கவிராயர் - அறப்பளீசுர சதகம்

அலகு 4. பிள்ளைத்தமிழ்

1. குமரகுருபரர் - மீனாட்சியம்மை பிள்ளை எத்தமிழ்

அலகு 5. தூது

1. தமிழ்விடு தூது முழுவதும்

## COURSE OUTCOME

- சிற்றிலக்கிய வடிவங்களை இனங்காணுவர்.
- அந்தாதி இலக்கியத்தின் இலக்கணத்தையும் சிறப்பியல்புகளையும் கற்றறிவர்.
- பிள்ளைத்தமிழ் இலக்கிய வகைமை, இலக்கண அமைப்பு முதலானவற்றை அறிந்துகொள்வர்.
- சிற்றிலக்கியங்களின் யாப்பு அமைப்பு, தோற்றம், வளரச்சீ நிலைகளைக் கற்பர்.
- சிற்றிலக்கியங்களில் காணலாகும் வரலாற்றுச் செய்திகளை ஆய்ந்தறிவர்.

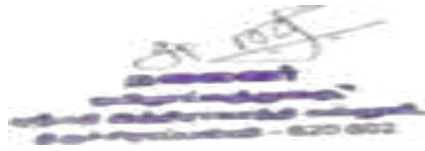
## COURSE MAPPING

### P22TA12- சிற்றிலக்கியம்

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	1	2	2	2	3	1	2
CO2	3	2	2	2	2	2	2	3
CO3	2	1	1	2	2	3	1	2
CO4	3	2	2	1	2	3	2	3
CO5	3	2	1	1	1	1	2	2
Average	3	2	2	2	2	3	2	2

A handwritten signature in blue ink is present, along with a purple circular stamp. The stamp contains text in Tamil, including the name of the institution and the date.

## தொல்காப்பியம் எழுத்ததிகாரம் (இளம்பூரணம்)

அலகு 1. நூன்மரபு - மொழிமரபு

அலகு 2. பிறப்பியல் - புணரியல்

அலகு 3. தொகைமரபு - உருபியல்

அலகு 4. உயிர்மயங்கியல் - புள்ளி மயங்கியல்

அலகு 5. குற்றியலுகரபு புணரியல்

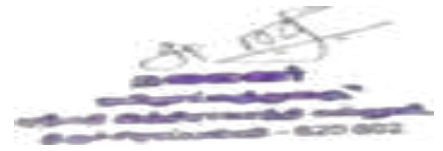
## COURSE OUTCOME

- எழுத்திலக்கணத்தின் தோற்றமும் வளர்ச்சியும் பற்றி அறிவர்.
- எழுத்துப் பிறப்பின் அறிவியல் தன்மையையும் தமிழ் எழுத்தொலிப்பு மாற்றத்தையும் ஒலித்து உணர்வர்.
- புணர்ச்சியியல்புகளைக் கற்று வேற்றுமை, அல்வழிப் புணர்ச்சிகளில் தெளிவு பெறுவர்.
- செய்யுளும் உரைநடையும் புணர்ச்சியில் வேறுபடும் இடங்களைக் கண்டறியும் ஆற்றலைப் பெறுவர்.
- எண்ணுபு பெயர்ப் புணர்ச்சி கூறும் முறைமையை அறிவர்.

## COURSE MAPPING

**P22TA13** – தொல்காப்பியம் எழுத்ததிகாரம்  
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	-	2	2	3	3	2	2
CO2	-	1	3	3	3	3	3	1
CO3	2	-	2	3	3	3	3	-
CO4	-	-	1	3	3	3	3	1
CO5	2	-	1	2	3	3	3	1
Average	3	1	3	3	3	3	3	2



## மொழியியலும் இக்காலத் தமிழும்

அலகு 1. மொழியியலும் துறைகளும் - ஒலியியல் கொள்கைகள் - ஒலியுறுப்புகளும் ஒலித்தொழில்களும் - மெய்யொலிகள் - உயிரொலிகள்.

அலகு 2. ஓசை இயல்புகள் - ஒலியனியல் கொள்கைச் சிக்கல்கள் - ஆக்கமுறை ஒலியனியல் - உருபனியல் அறிமுகம் - உருபன்களைக் கண்டறிதல் - நைடாவின் விதிகள் - உருபன்களின் இணைப்பு.

அலகு 3. உருபொலியனியல் - தொடரனியல் - தொடரனியல் கொள்கைகள் - தொடரனியல் கூறுகள் - தொடரனியல் வாதங்கள்.

அலகு 4. எழுத்து பற்றிய கொள்கைகள் - தமிழ் எழுத்துகள் - சந்தி வேறுபாடுகள் - சொற்பாகுபாடு - பெயாச்சொல்லும் வகைகளும் - திணை, பால், எண், இடம்.

அலகு 5. வேற்றுமைகள் - எழுவாய் வேற்றுமை - செயப்படுபொருள் வேற்றுமை - கருவி வேற்றுமை - உடனிகழ்ச்சி வேற்றுமை - கொடை வேற்றுமை - நீங்கல் வேற்றுமை - கிழமை வேற்றுமை - இட வேற்றுமை - விளி வேற்றுமை.

## COURSE OUTCOME

- மரபிலக்கணத்திற்கும் மொழியியலுக்குமான உறவினை ஆய்ந்தறிவர்.
- மொழியியல் அடிப்படையில் தற்காலத் தமிழைத் திறனாய்ந்தறிவர்.
- மக்கள் தகவல் தொடர்பு சாதனங்களில் ஊடாடி நிற்கும் தற்கால மொழியல் அமைப்பை ஆய்ந்துணர்வர்.
- மொழியில் உள்ள வாக்கிய அமைப்பைக் கற்றுணர்வர்.
- தமிழ் எழுத்துக்கள் குறித்தும் அவ்வெழுத்துகள் பற்றிய கருத்தாக்கத்தையும் தமிழ்மொழி காலந்தோறும் ஏற்படும் மாற்றத்தையும் தெளிவாக விளங்கிக் கொள்வர்.
- தமிழ் வேற்றுமைகள் மரபிலும் வழக்கிலும் வழங்கும் நிலையினைத் தெரிந்துகொள்வர்.

## COURSE MAPPING

### P22TACCC1A- மொழியியலும் இக்காலத் தமிழும்

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-”

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	3	3	3	3	3	2
CO2	3	3	3	3	3	3	3	1
CO3	3	3	3	2	3	2	3	2
CO4	3	3	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	2
CO6	1	-	2	-	2	3	2	-
Average	3	1	3	3	3	3	3	2



## மக்கள் தகவல் தொடர்பியல்

- அலகு 1. தொடர்பு - தொடர்பியல் - விளக்கம் - மக்கள் தகவல் தொடர்பு - அறிமுகம் - தனிமனிதத் தகவல் தொடர்பு, பொதுத் தகவல் தொடர்பு, மக்கள் தகவலியல், கூறுகள் - தருநர், செய்தி, கருவி, பெறுநர், விளைவு - விளக்கங்கள் - இரைச்சல் - எதிரூட்டு - தகவலியல் கருவிகளின் பாகுபாடுகள் - மரபுவழிச் சாதனங்கள், அச்சுச் சாதனங்கள், மின்னணுச் சாதனங்கள்.
- அலகு 2. ஊடகத் தொடர்பியல் கோட்பாடுகள் - பொதுவான விளக்கங்கள் - நால்வகைக் கோட்பாடுகள் - ஆட்சி ஆதிக்கக் கோட்பாடு, கட்டற்ற இதழ் சுதந்திரக் கோட்பாடு, சமுதாயப் பொறுப்புணர்வுக் கொள்கை - சோவியத் பொதுவுடைமைக் கொள்கை - தேசிய வளர்ச்சியில் பத்திரிகைகளின் பங்கு, கல்வி, வேளாண்மை, இலக்கியம், நலம், குடும்பக் கட்டுப்பாடு முதலியன.
- அலகு 3. பொதுமக்கள் கருத்து, புதிய கருத்துப் பரவுதல், கருத்தாக்கத் தலைவர்கள், பொதுமக்கள் கருத்தும் தகவல் தொடர்பு சாதனங்களும் - தகவல் தொடர்பியல் மாதிரிகள் - ஒருபடி நிலைப் பரவல் கொள்கை - இருபடி நிலை பரவல் கொள்கை - பலபடிநிலைப் பரவல் கொள்கை - லாஸ்வெல் மாதிரி - வீவர் மாதிரி - வெஸ்ட்லி - மெக்லீன் மாதிரி - வெள்ளித்தோட்டாக் கோட்பாடு.
- அலகு 4. வானொலி - வரலாறு - இந்திய வானொலி வரலாற்றில் சில மைல்கற்கள், இந்திய வானொலி வளர்ச்சி, தனித்தன்மைகள், கோட்பாடுகள் - வானொலி நிகழ்ச்சிகள் - வானொலி ஒலிபரப்பு - பன்னாட்டு ஒலிபரப்பு - செய்தி ஒலிபரப்பு - கல்வி ஒலிபரப்பு - கிராம ஒலிபரப்பு - பேச்சுரைகள் - வானொலியும் தன்னாட்சியும் - இன்றைய வானொலி.
- அலகு 5. தொலைக்காட்சி - வரலாறு - இந்தியாவில் தொலைக்காட்சி - செயற்கைக்கோள் வழிஒளிபரப்பு - சைட் (SITE) - கல்வி ஒளிபரப்பு (ETV) தொலைக்காட்சி நிகழ்ச்சிகள் - செய்தி ஒளிபரப்பு - தொலைக்காட்சிப் படங்கள் - தொடர்கள் (Serials) - விளம்பரங்கள் போன்றன - திரைப்படத்தோற்றம் - திரைப்பட வகைகள் - குழந்தைப் படங்கள் - செய்திப்படங்கள் - செய்தி விளக்கப்படங்கள் - தணிக்கைத்துறை - தேசியப் படசக் ருள் காப்பகம் - தேசிய திரைப்பட மேம்பாட்டு நிறுவனம்.

## COURSE OUTCOME

- மக்கள் தகவல் தொடர்பியலையும் அதன் உள்ளடங்கலையும் அறிந்து கொள்வர்.
- தகவலியல் கருவிகளின் பாகுபாடுகளைக் கற்றறிவர்.
- ஊடகத் தொடர்புக் கோட்பாடுகளைக் கற்றுணர்வர்.
- வானொலியின் தனித்தன்மைகளையும் நிகழ்ச்சி ஒளிபரப்புகளையும் அதன் தன்னாட்சி முறைகளையும் ஆயந்தறிவர்.



- செயற்கைக்கோள் வழி ஒளிபப் ரப்பப்படும் முறைமைகளை அறிந்து கொள்வர்.
- தேசியப் படச்சுருள் காப்பகத்தின் செயல்பாடுகளை ஆய்ந்தறிவர்.

## COURSE MAPPING

### P22TAE1A- மக்கள் தகவல் தொடர்பியல்

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	3	3	3	3	3	3	2
CO2	3	3	3	3	3	3	3	2
CO3	2	3	3	3	2	3	3	2
CO4	3	3	3	3	2	3	3	2
CO5	2	2	3	3	3	3	3	2
CO6	2	1	2	1	3	3	2	-
Average	3	3	3	3	3	3	3	2

Handwritten signature and stamp of the Head of Institution, Anna University, Chennai.

## பேச்சுக்கலை

அலகு 1. பேச்சு தயாரித்தல் - தலைப்பை முடிவு செய்தல் - குறிப்பெடுத்தல் -

வானொலி உரை, தொலைக்காட்சி உரை - இலக்கிய உரை -

அரசியல் உரை - சமய உரை தயாரித்தல்.

அலகு 2. மேடைத்தோற்றம் - பேச்சுத் தொடக்கம் - பேச்சு உட்பொருள்கள் -

மேற்கோள்கள் - முடிக்கும் முறை - பட்டிமன்றம் - வழக்காடு மன்றம்

- சுழலரங்கம்- அரட்டை அரங்கம்.

அலகு 3. வரலாற்றில் மேடைப் பேச்சாளர்கள் - உலக, இந்திய, தமிழக

அளவில் மேடைப் பேச்சாளர்கள்

அலகு 4. நடை - குரல் ஏற்றத்தாழ்வு - நகைச்சுவை - அவையறிந்து

பேசுதல் - விளிச்சு சொற்கள் - மேடை மெய்ப்பாடுகள் - கால

அளவு - உடல்மொழி.

அலகு 5. ஆட்சிமன்றக் குழுக்கூட்டங்கள் -

**ஆட்சிமன்றக்குழுவின் நடைமுறை** - ஆட்சி மன்றக்குழுக்

கூட்டங்களின் செயற்பாடுகள் - சட்ட மன்றப் பேச்சு

வகைகள் - சபாநாயகர் - ஆளுங்கட்சித் தலைவர் - எதிர்க்கட்சித்

தலைவர் - பாராளுமன்ற உறுப்பினர்கள் - சிறந்த மேடைப்

பேச்சாளர்கள்

## COURSE OUTCOME

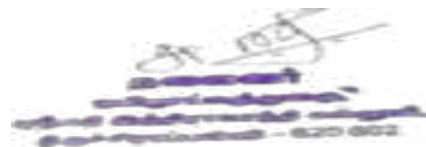
- மேடைப்பேச்சின் விதிமுறை, பண்பாட்டு நெறிமுறைகளைக் கற்றுறிவர்.
- சிறந்த மேடைப் பேச்சாளருக்குரிய பண்புகளை அறிந்து கொள்வர்.
- மேடைப் பேச்சின் வகைகளைக் கற்றுணர்வர்.
- மேடையில் சுவைதும்ப பேசுதல் எப்படி என்பதைக் கற்றுணர்வர்.
- மேடை நாகரிகத்தை அறிந்து கொள்வர்.
- சட்டமன்ற, பாராளுமன்றப் பேச்சு வகைகளை ஆய்ந்தறிவர்.

## COURSE MAPPING

### P22TAVAC1 – பேச்சுக்க கலை - ART OF ORATOR

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)  
If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	1	2	-	3	3	-	-	-
CO2	-	1	-	2	3	-	-	-
CO3	-	1	1	1	2	-	1	-
CO4	-	1	-	2	3	1	1	1
CO5	1	2	1	3	3	2	1	1
CO6	1	-	1	2	3	1	-	-
Average	1	2	1	3	3	2	1	1



## சமய இலக்கியம்

அலகு 1. திருஞானசம்பந்தர் முதல் திருமுறை - திருநள்ளாற்றுப் பதிகம். “பாடகமெல்லடிப் பாவையோடும்” முதல் 11 பாடல்கள். இரண்டாம் திருமுறை - திருவானைக்கா பதிகம் “மழையார் மிடறா மழு வாளுடையாய்” - முதல் 11 பாடல்கள். திருநாவுக்கரசர் ஐந்தாம் திருமுறை - திருவதிகை - தனிக்குறுந்தொகை “மாசில் வீணையும் மாலை மதியமும்” - முதல் 10 பாடல்கள். ஆறாம் திருமுறை - திருவாலங்காடு பதிகம் “ஒன்றா வலகனைத்து மானார் தாமே” - முதல் 10 பாடல்கள். சுந்தரர் தேவாரம் ஏழாம் திருமுறை - திருகற்குடி பதிப்பகம் “விடையாருங் கொடியாய் நெறியார்” - முதல் 10 பாடல்கள். திருவாரூப் பதிகம் - “கரையுங் கடலும் மலையும்” - முதல் 11 பாடல்கள்

அலகு 2. மாணிக்கவாசகர் எட்டாம் திருமுறை - சிவபுராணம் முழுவதும் 23 சேந் தனார் ஒன்பதாம் திருமுறை - திருவிசைப்பா- திருவாவடுதுறை “பொய்யா வேதியர்” முதல் 11 பாடல்கள். திருமூலர் பத்தாம் திருமுறை - திருமந்திரம் - அறம்செய்வார் பயன் - ஒன்பது பாடல்கள்.

அலகு 3. குலசேகராழ்வார் பெருமாள் திருமொழி - 4 ஆம் திருமொழி - “ஊனேறு செல்வத்து” 11 பாடல்கள் ஆண்டாள் நாச்சியார் திருமொழி - 7 ஆம் திருமொழி “கருப்பூரம் நாறுமோ” - முதல் 10 பாடல்கள் திருமங்கையாழ்வார் பெரிய திருமொழி - 5 ஆம் திருமொழி “கலையும் கரியும்” முதல் 10 பாடல்கள்

அலகு 4. கண்ணதாசன் இயேசு காவியம் - நான்காம் பாகம் - “நேரம் நெருங்குகிறது” முழுவதும் திரு.வி.கலியாணசுந்தரனார் கிறிஸ்துவின் அருள் வேட்டல் - “உலகமெலாம்” - முதல் 10 பாடல்கள் உமறுப்புலவர் சீராப்புராணம் - விலாதத்துக் காண்டம் - நாட்டுப் படலம் - முதல் 25 - பாடல்கள்

அலகு 5. குணங்குடி மஸ்தான சாகிபு பாடல்கள் நிராமயக் கண்ணி - “ஆதிமுதலே அண்டம் பரிபூரணம்” - முதல் 50 கண்ணிகள் தாயுமானவர் - “ஆசையெனும் பெருங்காற்று - முதல் 15 பாடல்கள் பட்டினத்தார் - “ஐயிரண்டு திங்களாய்” முதல் 10 பாடல்கள் 24

## COURSE OUTCOME

- சமய இலக்கிய வரலாற்றை அறிவர்.
- சமய நல்லிணக்கக் கோட்பாட்டை கற்று உணர்வர்
- சைவ சித்தாந்தம் நெறிமுறைகளைக் கற்றறிவர்.
- பாசுரங்கள் வழி பக்தி மேன்மையைக் கற்பர்.
- இஸ்லாம், கிறித்தவ சமய நெறிகளையும் இலக்கிய வடிவமைப்பையும் அறிந்து கொள்வர்.

## COURSE MAPPING

**P22TA21-** சமய இலக்கியம்

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	1	1	2	2	2	3
CO2	1	1	2	1	1	1	1	1
CO3	2	1	1	2	1	1	1	2
CO4	1	2	2	1	1	1	1	2
CO5	1	1	1	1	2	1	1	2
Average	2	2	2	2	2	2	1	3

*(Faint signature and stamp)*

## காப்பிய இலக்கியம்

அலகு 1. சிலப்பதிகாரம் - வஞ்சிக்காண்டம் முழுவதும் மணிமேகலை

- 24 முதல் 30 கதைகள் வரை (7 காதைகள்

அலகு 2. சீவக சிந்தாமணி - கனகமாலையார் இலம்பகம் பெருங்கதை -  
மகத காண்டம் (3 பகுதிகள்) 1. மகட்கொடை வலித்தது 2.  
பதுமாபதி வதுவை 3. படையெழுச்சி

அலகு 3. கம்பராமாயணம் - அங்கதன் தூதுப் படலம் பெரிய புராணம்  
- திருமூல நாயனார் புராணம்

அலகு 4. திருவிளையாடற் புராணம் - வன்னியும் கிணறும் இலிங்கமும்  
அழைத்த படலம் வில்லிபாரதம் - வாரணாவதச் சருக்கம்

அலகு 5. தேம்பாவணி - சீனிமாமலை காண்படலம் சீறாப்புராணம் -

மழையழைப்பித்த படலம்

## COURSE OUTCOME

- முவேந்தர் பற்றிய வரலாற்றினை அறிந்து கொள்வர்.
- தமிழர் பண்பாட்டுக் கூறுகளைக் கற்றறிவர்
- சமணம், பௌத்தம் முதலான சமயக் கருத்துகளைக் கற்றுணர்வர்.
- ஊழின் வலிமை, நட்பினர் கடமை, அரசாட்சி முறைமை, நீத்தார் பெருமை, சமண சமயக் கொள்கை போன்றவற்றைப் பெருங்கதை வழி அறிந்து கொள்வர்.
- காப்பியப் படைப்பாளரின் மொழிநடை, கற்பனை முதலான காப்பிய உத்திகளை ஆய்ந்தறிவர்.
- வண்ணம், ஓசை, சந்தம், நடை, சொற்கள் பயன்பாடு போன்ற இலக்கியச் சுவைகளைக் கற்றுணர்வர்.

## COURSE MAPPING

**P22TA22-** காப்பிய இலக்கியம்

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	2	1	1	1	1	3
CO2	1	1	1	1	2	2	1	2
CO3	1	1	1	1	2	2	1	2
CO4	2	1	1	1	2	2	1	2
CO5	2	1	1	1	2	2	1	2
CO6	2	1	1	1	1	2	1	2
Average	2	1	2	1	2	2	1	3



Head of Department  
Tamil University, Thanjavur  
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## தொல்காப்பியம் சொல்லதிகாரம் (சேனாவரையர்)

அலகு 1 கிளவியாக்கம்

அலகு 2 வேற்றுமையியல் - வேற்றுமை மயங்கியல் - விளிமரபு

அலகு 3 பெயரியல் - வினையியல்

அலகு 4 இடையியல் - உரியியல்

அலகு 5 எச்சவியல்

### COURSE OUTCOME

- திணை, பால், எண், இடங்களுக்குப் புறனடை நூற்பாக்கள் கூறும் இன்றியமையா முறைமையை விளங்கிக் கொள்வர்.
- வேற்றுமையின் தொகை, வகை, விரி இயல் பிணை விளங்கிக் கொள்வர்.
- உயர்திணைப் பெயர்கள், அஃறிணைப் பெயர்கள், விரவுப் பெயர்கள், வகை, விரி - இவற்றின் இலக்கணம், அவற்றின் பயன்பாடு ஆகியவற்றை இக்காலத் தமிழ் கொண்டு உணர்வர்.
- இடைச்சொற்கள் இக்கால வழக்கில் தொடருமாற்றையும் அருகி வருமாற்றையும் இனங்காண்பர்.
- புறனடைகளின் இன்றியமையாமையை விவாதிப்பர்

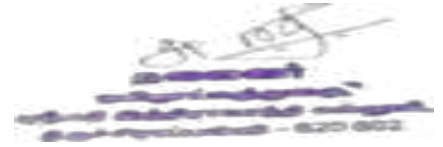


## COURSE MAPPING

**P22TA23** – தொல்காப்பியம் சொல்லதிகாரம் (சேனாவரையர்)

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)  
If there is no correlation, put “-”

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	1	-	2	2	-	1	2	-
CO2	2	-	2	2	1	2	1	-
CO3	1	-	3	1	2	1	1	-
CO4	2	-	3	2	2	1	1	-
CO5	1	-	3	1	1	2	2	1
Average	2	-	3	2	2	2	2	1

  
Handwritten signature and stamp in purple ink, likely of the course coordinator or faculty member.

## 2. இலக்கியத் திறனாய்வு

அலகு 1. இலக்கியத் திறனாய்வு - விளக்கம் - திறனாய்வின் இருவகைப் பணிகள் -

திறனாய்வாளரின் தகுதிகள் - இலக்கியமும் வாழ்க்கையும் - இலக்கியஉணர்ச்சிகள்

இலக்கியத்தின் அடிப்படைக் கூறுகள் - உணர்ச்சி- வடிவம் - கருத்து - கற்பனை.

அலகு 2. திறனாய்வு வகைகள் - விளக்கமுறைத் திறனாய்வு - ஒப்பீட்டுமுறைத்

திறனாய்வு - மதிப்பீட்டு முறைத் திறனாய்வு - அழகியல் திறனாய்வு - பாராட்டு

முறைத் திறனாய்வு - விதிமுறைத் திறனாய்வு - பகுப்புமுறைத் திறனாய்வு -

திறனாய்வில் அறிவியல் அணுகுமுறைகள்: சமுதாயவியல், வரலாற்றியல்,

உளவியல், அமைப்பியல், மார்க்சியம், பெண்ணியத் திறனாய்வுகள்.

அலகு 3. இலக்கிய மரபு - இலக்கிய வகைப்பாடுகள் - காப்பியங்கள் - நாடகம் -

புதினம் - சிறுகதை - மரபு.

அலகு 4. இலக்கியக் கலை - இலக்கியமும் திறனாய்வும் - கவிதைக்கலையும்

பொருளும் - கவிதையில் உவமை, உருவகம் பெறுமிடமும் அகப்புறச்

செய்திகளும் - கலை கலைக்காகவே - வாழ்க்கை இலக்கணம்.

அலகு 5. இலக்கியத் திறனாய்வியல் - திறனாய்வும் இலக்கியமும் - இலக்கியக்

கூறுகள் - இலக்கிய இயக்கங்கள் : புனைவியல் - காந்தியம் - அழகியல் வாதம்

நனவோடைஉத்தி - படிமம், கோட்பாடு - குறியீட்டியல் - இருண்மை வாதம்

- பொதுவுடைமை.

## COURSE OUTCOMES

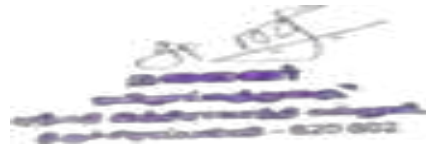
- இலக்கியங்களில் காணும் உவமை உணர்ச்சி, கற்பனை, வடிவம் முதலான இலக்கியக் கூறுகளைக் கண்டறிவர்.
- திறனாய்வு வகைகள் குறித்துக் கற்றறிவார்.
- அமைப்பியல், பின் அமைப்பியல், நவீனத்துவம், பின் நவீனத்துவக் கோட்பாடுகளை
- இலக்கியங்களின் வழி ஆராய்ந்தறியும் ஆற்றலைப் பெறுவார்.
- இலக்கிய விமர்சனப் போக்குகள் குறித்து அறிவார்.
- ஆய்வுப்பொருள் பற்றிய அறிதிறனை வளர்த்துக் கொள்வார். •

## COURSE MAPPING

### P22TACCC2B – இலக்கியத் திறனாய்வு

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High) there is no correlation, put“- If

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	-	2	3	2	3	2	1
CO2	2	-	1	2	1	2	2	-
CO3	3	-	2	2	2	3	2	1
CO4	2	-	2	3	2	2	1	-
CO5	3	-	2	2	2	1	2	1
Average	3	-	2	3	2	3	2	1



## சுவடியியல்:

அலகு 1. சுவடியியல் - சொற்பொருள் விளக்கம் - நோக்கம் - பயன் - தோற்றமும் வளர்ச்சியும் ஏடு தயாரிக்கும் முறைகள் - பதப்படுத்தும் முறைகள் - சுவடிகளின் அமைப்புகள் - சுவடிகளின் வகைகள் - எழுத்தாணி வகைகள் - சுவடி எழுத்தும் மற்றும் எழுதிய முறைகள் - சுவடிகளில் எழுத்துகளும் குறியீடுகளும் - சுவடி திரட்டுதல்.

அலகு 2. சுவடிகளைப் பாதிக்கும் காரணிகள் - சுவடிகளைச் செப்பனிடும் முறைகள் - சுவடி பாதுகாப்பிற்காகப் பயன்படும் கருவிகள் - மருந்துப் பொருள்கள் - சுவடி நூலகப் பாதுகாப்பு முறைகள்.

அலகு 3. சுவடிப் பாதிப்பு முன்னேற்பாடுகள் - படியெடுத்தல் - சிக்கல் தோன்றும் முறைகள் - சிக்கல் நீக்கும் முறைகள் - எழுத்துமுறை - பாட்டு அமைப்பு - ஒப்பிடும் பணி - மீட்டுருவாக்கம் - பாதிப்பு வகைகள் - பதிப்பு முன்னோடிகள்.

அலகு 4. மூலபாட ஆய்வு - சொற்பொருள் - தோற்றமும் வளர்ச்சியும் - மூலபாட ஆய்வு முறைகள் - மூலபாடத் தேர்வு முறைகள், பாட வேறுபாடு, சொற்பொருள் - வகைகள் - பாட வேறுபாடு தோன்றக் காரணங்கள்.

அலகு 5. நூல் முன்னிணைப்புகள் - பதிப்புப் பணிகள் - பிரிப்பு முறை - பிரிப்பு வரன்முறை - நிறுத்தற் குறியீடுகள் - அடிகுறிப்பு, நூல் பின்னிணைப்புகள், பாடல் முதற் குறிப்பகராதி - சொற்பொருள் விளக்க அகராதி - ஆய்வடங்கல் - சொல்லடைவு.

## COURSE OUTCOMES

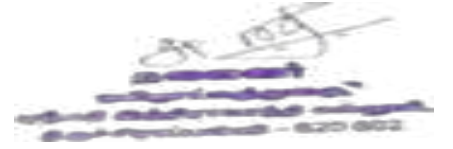
- சுவடியியல் குறித்த அறிதிறனை வளர்த்துக் கொள்வர்.
- ஏடு தயாரிக்கும் முறை, பதப்படுத்தும் தன்மைகள் முதலானவற்றைக் கற்றறிவர்.
- சுவடி எழுதும் முறைகள், எழுத்தாணி வகைகள் குறித்து அறிந்து கொள்வர்.
- சுவடியைப் பாதிக்கும் காரணிகளைக் கற்று முறையாகச்
- சுவடியைப்பாதுகாக்கும் ஆற்றலைப் பெறுவர்.
- படியெடுக்கும் முறைகள், படியெடுக்கும் போது ஏற்படும் சிக்கல்களை எவ்வாறு களைவது என்பதைக் கற்றறிவர்.
- பதிப்பு பணிகள் குறித்துக் கற்றுணர்வர்

## COURSE MAPPING

**P22TAE2B – ಕವಾಯಿಯಲ್:**

Moderate (Medium)3: Substantial (High) If there is no correlation, put “-

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	2	2	3	3	3	2
CO2	3	1	2	2	2	3	3	2
CO3	3	1	-	2	3	2	3	-
CO4	2	-	2	2	2	2	2	-
CO5	3	1	2	2	3	3	3	1
CO6	3	1	1	3	3	3	3	2
Average	3	2	2	2	3	3	3	2



## அற இலக்கியம்

அலகு 1. திருக்குறள் - அறத்துப்பால் (20 அதிகாரங்கள்) தனிமனித அறம்

- இனியவை கூறல், செய்ந்நன்றி அறிதல், அடக்கமுடைமை, வாய்மை குடும்ப அறம் - அன்புடைமை, இல்வாழ்க்கை, வாழ்க்கைத் துணைநலம், விருந்தோம்பல், வெகுளாமை சமுதாய அறம் - அருளுடைமை, நடுவு நிலைமை, பொறையுடைமை, அழுக்காறாமை, வெட்காமை, புறங்கூறாமை, ஒப்புரவு அறிதல், கள்ளாமை, புகழ், துறவு

அலகு 2. நாலடியார் - நிலையாமை அறம் (40 பாடல்கள்) - செல்வம் நிலையாமை இளமை நிலையாமை யாக்கை நிலையாமை

அலகு 3. பழமொழி நானூறு - 10 பாடல்கள் - பாம்பறியும் பாம்பின் கால் (8) - நிறைகுடம் நீர்த் தளும்பல் இல் (10) - குன்றினமேல இட்ட விளக்கு (81) - திங்களை நாய் குரைத்தற்று (108) - நுணலுந் தன் வாயாற் கெடும் (115) - இருதலைக் கொள்ளி எறும்பு (142) - தொளை எண்ணார் அப்பம் தினப் பார் (166) - தனிமரம் காடாதல் இல் (287) - நாய் வால் திருந்துதல் இல் (317) - பூவொடு நார் இயைக்குமாறு (355) இனியவை நாற்பது - 10 பாடல்கள் - கடமுண்டு வாழாமை (11) 42 - சலவரைச் சாரா வரை இன்னா நாற்பது - 10 பாடல்கள் - மனித குலத்துக்கு இன்னாதவை (31) - முதல் கொடுக்கும் பொருளில்லான் வரை (40)

அலகு 4. திரிகடுகம் - மனித மன இயல்புகள் - 'வருவாயுட் கால்வழங்கி' முதல் 'தன் நச்சிச் சென்றாரை' வரை (21-30) நானம் ணிக்கடிகை - ஒற்றுமை (10 பாடல்கள்) 21 முதல் 30 வரை - பெற்றான் அதிர்ப்பின் (21) - கற்பக் கழிமடம் வரை (30) சிறுபஞ்சமூலம் - தன்னடக்கம் (10 பாடல்கள்) - கொன்று ண்பான் நாச்சாம் (10) - பொய்யாமை பொன் பெறினும் வரை (19)

அலகு 5. மனித விழுமியங்கள் - முதுமொழிக்காஞ்சி, ஏலாதி, ஆசாரக்கோவை (31 பாடல்கள்) முதுமொழிக்காஞ்சி - சிறந்த பத்து (1-10)

பாடல்கள்) ஏலாதி - இம்மை இன்பம் : உண்ணீரவ் ளங் குளம் கூவல்  
முதல் பெருமை புகழறம் வரை (51-60 பாடல்கள் ) ஆசாரக்கோவை -  
உணவுகொள் முறைமை : நீராடிக் கால் கழுவி முதல் இழியாமை நன்குமிழ்  
வரை (18 முதல் 28 வரை)

## COURSE OUTCOMES

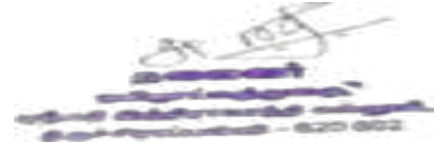
- அறநூல்களின் அமைப்பும் பகுப்பும் குறித்து ஆய்ந்தறிவர்.
- நாலடியாரின் தனித்தன்மைகளைக் கற்றறிவர்.
- நிலையாமைச் சிந்தனையை வளர்த்துக் கொள்வர்.
- ஒழுக்கமுடைமை கற்றலில் சிறந்தது எனப் தை அறநூல்கள் வழி உணர்வர்.
- நீதி நூல்களின் கருத்துக்களைத் திருக்குறள் கருத்துகளோடு ஒப்பிடட் றிவர்.
- நீதி கூறும் தமிழர் மரபினைக் கற்றுணர்வர்.

## COURSE MAPPING

P22TACC31 - அற இலக்கியம்

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High) • If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	3	3	3	2
CO2	3	1	2	2	2	3	1	1
CO3	-	2	-	3	1	-	-	2
CO4	3	2	2	3	3	3	2	-
CO5	3	3	3	2	3	3	2	3
CO6	2	2	-	2	2	2	2	2
Average	3	3	3	3	3	3	3	2

  
Handwritten signature and stamp in purple ink, likely of an official, located at the bottom right of the page.



## ஆராய்ச்சி நெறிமுறைகள்

அலகு 1. ஆராய்ச்சி - விளக்கம் - ஆய்வுமுறைகள் - ஆய்வாளருக்குரிய தகுதிகள் - ஆய்வு அறம் - ஆய்வில் உத்திகள். அலகு 2. ஆய்வுத் தலைப்பைத் தேர்ந்தெடுத்தல் - சிக்கல்களின் தோற்றுவாய்கள் - கருதுகோள் - கருதுகோள் இலக்கணம் - ஆய்வில் கருதுகோளின் இடம், கருதுகோளை உருவாக்கும் வாயில்கள், கருதுகோளை உருவாக்கும் விதம், கருதுகோளின் வகைகள்.

அலகு 3. தரவுத் தொகுப்பு முயற்சிகள் - கள ஆய்வு, நேர்காணல், உற்று நோக்கல், வினாநிரல், நூலகப் பயன்பாடு - முதன்மை, துணைமை ஆதாரங்கள்.

அலகு 4. ஆய்வுக் கட்டுரை எழுதும் முறை - ஆய்வேட்டின் அகக்கட்டமைப்பு - முன்னுரை, ஆய்வுத் தலைப்பு விளக்கம், மேற்கொள்ளும் ஆய்வுமுறை, கருதுகோள் விளக்கம், இயல் முன்னுரையும் பத்திப்பிரிப்பும், எடுத்துரை உத்திகள், இயல் முடிப்பு, அடிக்குறிப்பும் மேற்கோளும், ஆய்வுநடை, இயல் இயைபு, முடிவுரை, துணைநூற்பட்டியல், பின்னிணைப்புகள் - ஆய்வேட்டின் புறக்கட்டமைப்பு - அட்டையமைப்பு, ஒட்டுத்தாள், தலைப்புப்பக்கம், சான்றிதழ்கள், நன்றியுரை, முன்னுரை, இயல்கள், முடிவுரை, பின்னிணைப்புகள்.

1. அலகு 5. தமிழியல் ஆராய்ச்சியின் தோற்றமும் வளர்ச்சியும் - தமிழியியல் ஆய்வு முன்னோடிகள்- கோட்பாடுகள் - மானிடவியல், உளவியல், மார்க்சியம், பெண்ணியம், பின் நவீனத்துவம், பின் அமைப்பியல்.

## COURSE OUTCOMES

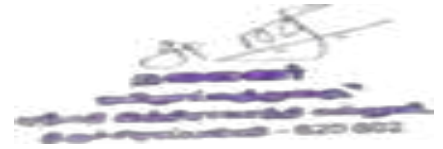
- ஆராய்ச்சி குறித்தும் ஆய்வுமுறைகள் பற்றியும் அறிந்து கொள்வர்.
- ஆய்வுத் தலைப்பை எவ்வாறு தேர்வு செய்வது, ஆய்வில் கருதுகோள்களை எவ்வாறு உருவாக்குவது என்பதைக் கற்றறிவர்.
- தரவுகளைச் சேகரிக்கும் முறைகளைக் கற்று ஆய்வுக்குத் தேவையான தரவுகளைச் சேகரிக்கும் திறனை வளர்த்துக் கொள்வர்.
- முதன்மை, துணைமை ஆதாரங்கள் குறித்த தெளிவினைப் பெறுவர்.
- ஆய்வுக்கட்டுரை எழுதும் முறைகள் பற்றியும் ஆய்வேட்டின் அகக் கட்டமைப்பு, புறக்கட்டமைப்பு பற்றியும் அறிந்து கொள்வர்.
- ஆய்வு நுட்பங்களைக் கற்றறிந்து அவற்றைத் தம் ஆய்வில் பயன்படுத்தும் திறனைப் பெறுவர்.

## COURSE MAPPING

### P22TACC32- ஆராய்ச்சி நெறிமுறைகள்

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	3	1	2	3	2	1
CO2	1	2	2	2	3	2	2	1
CO3	3	2	3	2	2	2	1	2
CO4	2	2	2	2	2	1	1	2
CO5	2	2	3	2	3	2	1	2
CO6	2	1	2	2	3	3	2	2
Average	3	2	3	2	3	3	2	2



## தொல்காப்பியம் பொருளதிகாரம் (இளம்பூரணம்)

அலகு 1. அகத்திணையியல்

அலகு 2. புறத்திணையியல்

அலகு 3. களவியல்

அலகு 4. கற்பியல்

அலகு 5. பொருளியல்

### COURSE OUTCOMES

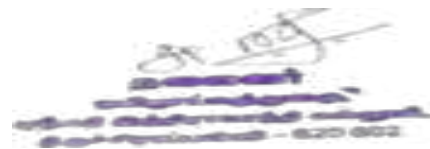
- பொருளிலக்கணத்தின் தோற்றமும் வளர்ச்சியும் பற்றி அறிவர்.
- தொல்காப்பியக் கவிதையியல் கோட்பாடுகளைக் கற்றறிவர்.
- அக, புற இலக்கணங்களைப் பகுத்தறிவர்.
- அகத்திணை புறத்திணை வகைகளுக்கும் ஒலிபியலாகப் பொருளியல் அமைந்துள்ளதை அறிந்துணர்வர்.
- உள்ளுறை, இறைச்சிக் கோட்பாட்டினைக் கற்றுணர்வர்.

## COURSE MAPPING

**P22TACC33 – தொல்காப்பியம் பொருளதிகாரம்(இளம்பூரணம்)**

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High) If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	1	1	1	3	2	1	1
CO2	2	2	1	2	3	2	1	2
CO3	2	1	2	2	2	1	2	1
CO4	2	2	2	1	2	2	1	2
CO5	2	2	1	2	2	2	2	1
Average	3	2	2	2	3	2	2	2

  
Handwritten signature and stamp in purple ink, likely of the course coordinator or faculty member.

## ஒப்பிலக்கியம்

அலகு 1. ஒப்பிலக்கியம் - சொற்பொருள் ஆய்வு - ஒப்பீடும் ஒப்பிலக்கியமும் - ஒப்பீட்டின்பொதுப்பண்புகள் - தொகுத்துக் கூறுதல், ஒருபுடை ஒப்புமைகளைச் சுட்டுதல் - ஒருமொழிக்குள் ஒப்பீடு - ஒப்பிலக்கியத்திற்கு வரைவிலக்கணம் - ஒப்பிலக்கியத்தின் பயன்கள் - தேசியப் பண்புகளைப் பாதுகாத்தல் - பன்மையில் ஒருமை காணுதல் - அறிவியல் பார்வையை வளர்த்தல் - தற்சார்புக் கண்ணோட்டத்தை அகற்றுதல்.

அலகு 2. இலக்கியங்களுக்கிடையே ஒப்பாய்வு - பொதுத் தன்மைகள் - இலக்கிய உணர்வு -

காலப்பகுதி அடிப்படையில் ஒப்பீடு - பண்பாட்டுணர்வு - தொன்மக் குறியீடுகள் - இலக்கியமும் பிற துறைகளும் - இலக்கியமும் கவின் கலைகளும் - இலக்கியமும் ஓவியமும் - இலக்கியமும் இசையும் - இலக்கியமும் கட்டடக் கலையும்.

அலகு 3. இலக்கியமும் பிற துறைகளும் - இலக்கியமும் தத்துவமும் - இலக்கியமும் வரலாறும் - இலக்கியமும் சமூக அறிவியலும் - இலக்கியமும் சமூகவியலும் - இலக்கியமும் உளவியலும் - இலக்கியமும் அறிவியலும் - சார்பியல் கோட்பாடு - முருகியல் கோட்பாடு.

அலகு 4. இலக்கியமும் மனிதவள மேம்பாடும் - இலக்கியமும் சமயமும் - இலக்கியமும் நாட்டுப்புறவியலும் - தாக்கக் கொள்கை (ஏற்பு, செல்வாக்கு, தாக்கம்) - தாக்கங்களின் வகைகள் - நேரடித் தாக்கம், வேற்றுமை உணர்தல் - பொது மூலங்களைத் தேடுதல் - தொடர்புத் தாக்கம் - அயன்மை இலக்கியத் தாக்கம் - மன எழுச்சித் தாக்கம் - மறைமுகத் தாக்கம் - எதிரம் றைத் தாக்கம் - தாக்கத்திற்கு உரிய சூழல்.

அலகு 5. அடிக்கருத்தியல் - அடிக்கருத்தும் கதை மாந்தரும் - அடிக்கருத்தும் இடமும் -

மனிதனும் இடமும் - புனைவுக் கூறு - சங்கப் பாடல்களும் வீரயுகப் பாடல்களும் - திருக்குறளும் உலக அற இலக்கியங்களும் - பாரதியும் ல்லியும்.

## COURSE OUTCOMES


- ஒப்பிலக்கியத்தின் வரலாற்றை அறிந்து கொள்வர்
- இலக்கியங்களை ஒப்பிட்டுப் பார்க்கும் திறனை வளர்த்துக் கொள்வர்.
- ஒப்பிலக்கியத்தின் வழி இலக்கியப் பொதுமைச் சிந்தனைகளை ஆய்ந்தறிவர்.
- இலக்கியங்களின் உலகளாவிய பார்வையைக் கற்றுறிவர்.
- ஒப்பிலக்கியக் கோட்பாடுகளைக் கற்றுணர்வர்.
- தமிழ் இலக்கிய வகைகளுக்கும் பிறமொழி இலக்கிய வகைகளுக்கும் உள்ள ஒற்றுமை வேற்றுமைகளை ஆய்ந்தறிவர்

## COURSE MAPPING

### P22TACC3A – ஒப்பிலக்கியம்

Slight (Low) 2: Moderate (Medium)3: Substantial (High) If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	1	2	3	2	1	1	2	2
CO2	3	2	2	1	2	1	3	1
CO3	2	-	2	1	2	2	1	-
CO4	3	1	2	3	3	3	2	2
CO5	2	3	2	3	2	3	2	2
CO6	3	1	3	3	2	3	2	3
Average	3	3	3	3	3	3	3	3

  
Handwritten signature and stamp, likely of the course coordinator or instructor.

## சித்தர் இலக்கியம்

அலகு 1. சித்தர் அறிமுகம் - பிரணவ மந்திரம்

அலகு 2. பாம்பாடடிச் சித்தர் - கடுவெளி சித்தர் பாடல்கள்

அலகு 3. அகப்பேய்ச் சித்தர் - குதம்பைச் சித்தர் - திருமூலநாயனார்  
பாடல்கள்

அலகு 4. அகத்தியர், வால்மீகர் - அழகுணிச் சித்தர் பாடல்கள் அலகு 5.

சட்டைமுனி - திருவள்ளுவர் - இராமதேவர் - கருவூர் சித்தர்

## COURSE OUTCOMES

- சித்தாந்தத் தத்துவ நெறிகளைக் கற்றுணர்வர்.
- சித்தர் பாடல்களில் காணலாகும் அறிவியல், இறையணர்வுச் சிந்தனைகளை ஆய்ந்தறிவர்.
- அட்டமா சித்திகள் குறித்துக் கற்றறிவர்.
- சித்தர்கள் கூறும் வாழ்வியலுக்கான நெறிமுறைகளை அறிந்து கொள்வர்.
- சித்தர் பாடல்களில் இடம்பெற்றுள்ள இலக்கியச் சுவைகளைப் பகுத்தறிவர்.

## COURSE MAPPING

P22TAE3A- சித்தர் இலக்கியம்

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

• If there is no correlation, put “-“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	3	1	2	3	1	-	1
CO2	3	1	2	3	2	1	2	2
CO3	1	2	1	2	2	1	2	3
CO4	2	1	3	2	2	2	1	2
CO5	2	1	2	-	3	3	2	2
Average	3	3	3	3	3	3	2	3





## சங்க இலக்கியம்

அலகு 1 நற்றிணை - பாடல் 76 முதல் 90 வரை குறுந்தொகை - பாடல் 26

முதல் 40 வரை அகநானூறு - நித்திலக்கோவை - பாடல் 1-5

அலகு 2 ஐங்குறுநூறு - தாய்க்குரைத்த பத்து (நெய்தல்) - முழுவதும்

(101-110) கலித்தொகை - பாலைக்கலி 1-5 பாடல்கள் பரிபாடல் -

செவ்வேள் - 3 வது பாடல்

அலகு 3 புறநானூறு - ஒளவையார் பாடல்கள்(87,89,90,91,92,93,94,95,96,97)

அலகு 4 முல்லைப்பாட்டு - முழுவதும் பொருநராற்றுப்படை - முழுவதும்

அலகு 5 நெடுநல்வாடை - முழுவதும்

## COURSE OUTCOMES

- சங்க அக இலக்கியங்களில் காணலாகும் வரலாற்றுச் செய்திகளைக் கற்றறிவர்.
- உள்ளுறை, இறைச்சி பாடல்களில் அமைந்துள்ள நுட்பத்தினை ஆய்ந்தறிவர்.
- அகத்திணைக் கொள்கைகளும் கோட்பாடுகளும் குறித்துக் கற்றுணர்வர்.
- முதல், கரு, உரிப்பொருள்கள் பாடலில் இடம்பெற்றுள்ளமையைத் திறனாய்ந்தறிவர்
- புறத்திணை ஒழுகலாறுகளை அறிவர்.
- சங்ககால அரசியல் முறைமைகளைக் கற்பர்.

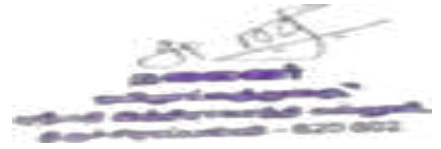
## COURSE MAPPING

### P22TACC41 – சங்க இலக்கியம்

Slight (Low) 2: Moderate (Medium)3: Substantial (High) If there is no correlation, put “-

“

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	2	3	3	3	3	2
CO2	2	2	2	2	2	3	2	3
CO3	3	2	2	1	2	3	2	2
CO4	3	3	2	2	3	3	2	3
CO5	2	1	1	2	2	3	2	3
CO6	1	1	2	2	3	3	1	2
Average	3	3	2	2	3	3	3	3



## தொல்காப்பியம் பொருளதிகாரம்

- அலகு 1. மெய்ப்பாட்டியல்  
அலகு 2. உவமவியல்  
அலகு 3. செய்யுளியல் (சூத்திரம் 1 - 119 'கட்டுரை வகையான...

என்பது முடிய)

- அலகு 4. செய்யுளியல் (சூத்திரம் 120 - 235  
'அங்கதந் தானே ... என்பது முடிய)  
அலகு 5. மரபியல்

### COURSE OUTCOMES

- எண்வகை மெய்ப்பாடுகளையும் அவற்றின் வகைகளையும் கற்றறிவர்.
- ஐந்திணைகளுக்குரிய மெய்ப்பாடுகளையும் அகப்புறத்திணை மெய்ப்பாடுகளையும் பகுத்தாயும் திறனைப் பெறுவர்.
- தொல்காப்பிய உவமையியலைப் பிற இலக்கணங்களுடன் ஒப்பிட்டு ஆராய்வார்.
- உயிர்ப் பாகுபாடு, வர்ணப்பாகுபாடு ஆகியவற்றினை ஆராய்ந்தறியும் ஆற்றலைப் பெறுவர்.
- தொல்காப்பியரின் மெய்ப்பாடு, உவமம் ஆகியவற்றை வடமொழியாளர்களின் கோட்பாடுகளோடு ஒப்பீடு செய்து பார்க்கும் அறிவு பெறுவர்.

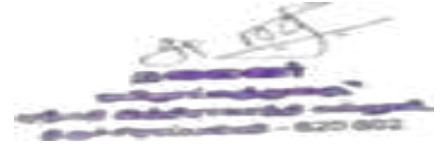
## COURSE MAPPING

**P22TACC42**— தொல்காப்பியம்பொருளதிகாரம்

1: Slight (Low) 2: Moderate (Medium)3: Substantial (High)

If there is no correlation, put “- “

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	2	3	1	3	2	3
CO2	3	2	2	1	2	3	1	2
CO3	1	1	2	-	1	3	2	1
CO4	2	2	2	1	2	3	1	2
CO5	3	-	3	3	2	3	3	2
Average	3	2	3	3	2	3	3	3

  
Handwritten signature and stamp in purple ink, likely of the course coordinator or a faculty member.

## இணையமும் தமிழும்

அலகு 1. தமிழில் இணையம் - இணையம் அறிமுகம் - இணையத்தின் வரலாறு - இணையதள முகவரிகள் - உலக இணைய வரலாற்றில் குறிப்பிடத்தக்க செய்திகள் - தமிழ் இணைய மாநாடுகள் - இணையத் தமிழ்ப் பங்களிப்பாளர்கள் - இணையத்தின் நன்மைகளும் தீமைகளும்.

அலகு 2. இணையவழிக் கல்வி : கற்றல் கற்பித்தலில் இணையத்தின் பங்கு - மின்வழிக் கற்றலின் பயன்பாடுகள் - மின் நூலகங்கள் : தமிழ் இணையக் கல்விக் கழகம் - மதுரைத் திட்டம் - தமிழ் விக்கிப்பீடியா - கல்விசார் இணையத்தளங்கள் - உயர்கல்வி நிறுவனங்களின் இணையதளங்கள் - வேலைவாய்ப்பு இணையதளங்கள் - இணைய இதழ்கள்.

அலகு 3. தமிழில் இணையப் பயன்பாடுகள் : தமிழ் வலைப்புகக்கள் உருவாக்கம் - வலைப்பதிவுகளின் திரட்டிகள் - மின்னஞ்சல் உருவாக்கம் - மின் அரட்டை - மின் ஆளுகை - மின் குழுக்கள் - இணைய அங்காடிகள் - தமிழ் எழுத்துருப் பதிவிறக்கம் செய்தல் - தமிழ் எழுத்துரு மாற்றிகள்.

அலகு 4. தமிழ் மென்பொருள்கள் : இணையத்தில் தமிழ் மென்பொருள்கள் - அறிமுகம் - தமிழ் எழுத்துருக்கள் - தமிழ் சொற்பொருள்திருத்தி - சந்திப்பழை திருத்தி - தமிழ் மின் அகராதி மென்பொருள் - சொற்செயலிகள் - பேச்சணி - ஒலி எழுத்தணி - கையெழுத்தணி - யாப்பு உணரி - ஒலிபெயர்ப்பு உணரி - கணினித் தமிழ் வளர்ச்சியில் கட்டற்ற மென்பொருள்.

அலகு 5. சமூக ஊடகங்கள் : அறிமுக அளவில் சமூக ஊடகங்கள் - தமிழ்க் குறுஞ்செயலிகள் - கீசச் கம் (Twitter) - முகநூல் (Facebook) - புலனம் (Whatsapp) - வலையொலி (Youtube) - காயலை (Skybe) - இன்ஸ்டாகிராம் (Instagram) பயன்பாடுகள் - ஸ்னாப்சாட் (Snapsat) - நன்மைகளும் தீமைகளும்.

## COURSE OUTCOMES

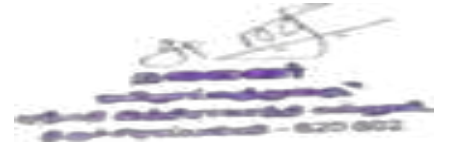
- இணையம் குறித்து அறிவர்.
- கற்றல் கற்பித்தலில் இணையத்தைப் பயன்படுத்தும் திறனைப் பெறுவர்.
- வலைப்புகக்களை உருவாக்கித் தம் கருத்துகளைப் பதிவேற்றம் செய்யும் ஆற்றலைப் பெறுவர்.
- மென்பொருள்களைக் கையாண்டு பிழையற எழுதும் திறனை அடைவர்.
- சமூக ஊடகங்களைத் தேவையறிந்து திறம்படக் கையாளும் நுட்பத்தினைக் கற்றறிவர்

## COURSE MAPPING

**P22TAIBC – இணையமும் தமிழும்**

Slight (Low) 2: Moderate (Medium)3: Substantial (High) If there is no correlation, put “- “

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	2	3	2	2	2	2
CO2	3	3	2	3	3	3	2	1
CO3	2	2	3	2	2	1	1	1
CO4	3	1	3	3	3	1	3	3
CO5	3	3	3	3	3	3	3	3
Average	3	3	3	3	3	3	3	3



## படைப்புக்கலை

அலகு 1. கட்டுரை அமைப்பு கருதுகோள் - முன்னுரை - கட்டுரையின் உடல் - உட்தலைப்புகள் - முடிவுரை - கட்டுரை வகைகள் - விஞ்ஞானக் கட்டுரை - வாழ்த்துக் கட்டுரை - மாசுக்கட்டுபாடு மக்கள் தொகை, தேசியம், இலக்கண, இலக்கியக் கட்டுரைகள், பயணக் கட்டுரைகள்.

அலகு 2. கவிதை எழுதுதல் : மரபுக் கவிதை - வெண்பா - ஆசிரியப்பா - கலிப்பா - வஞ்சிப்பா - சிந்து - கண்ணிகள் - தாழிசை - விருத்தம் ஆகிய பா வடிவங்கள்.

அலகு 3. புதுக்கவிதை : இலக்கணம் - படிமம் - குறியீடு - இருண்மை - தொன்மம் - கற்பனை - நாட்டுப்புறச் சாயல் - பாடுபொருள்.

அலகு 4. சிறுகதை எழுதுதல் : இலக்கணம் - பாடுபொருள் - ஒரு பக்கச் சிறுகதை - அரைபக்கச் சிறுகதை - அஞ்சலட்டைச் சிறுகதை - கருத்து, பண்பு விளக்கச் சிறுகதை - அரசியல், சமுதாயம், குடும்பம் இவற்றை மையமாகக் கொண்ட சிறுகதைகள் எழுதப் பயிற்சி அளித்தல்.

அலகு 5. நாடக இலக்கணம் - நாடக வளர்ச்சி நிலைகள் - வானொலி நாடகம் - தொலைக்காட்சி நாடகம் - ஓரங்க நாடகம் - வதி நாடகம் - திரைக்கதை எழுதப் பயிற்சி வழங்குதல்.

## COURSE OUTCOMES

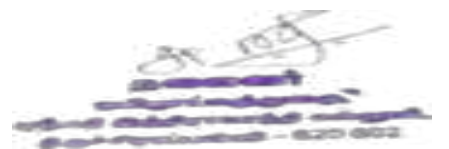
- கட்டுரைகள் எழுதும் முறைமையைக் கற்றறிவர்.
- மரபுக்கவிதை இலக்கணத்தைக் கற்றுக் கவிதை எழுதும் திறனை அடைவர்.
- புதுக்கவிதையின் உத்திகளைப் பயன்படுத்திக் கவிதை இயற்றும் ஆற்றலைப் பெறுவர்.
- நாடகங்களை உருவாக்கும் வல்லமையைப் பெறுவர்.
- திரைக்கதை இயற்றும் நுட்பத்தினை ஆயந்தறிவர்.

## COURSE MAPPING

### P22TAVAC2 – படைப்புக்கலை

Slight (Low) 2: Moderate (Medium)3: Substantial (High)

PO/PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	1	-	1	1	2	-	2	3
CO2	-	1	-	2	-	-	1	2
CO3	-	3	1	2	2	2	1	3
CO4	-	3	1	3	-	2	1	1
CO5	-	3	3	3	2	1	1	2
Average	1	3	3	3	2	2	2	3









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Tiruchirappalli - 620 001

## **PG&RESEARCH DEPARTMENT OF COMMERCE**

### **M.Phil. Commerce**

#### **PROGRAMME OUTCOMES IN COMMERCE (M.Phil.)**

PO 1: Acquired the knowledge in the field of commerce

PO 2: Familiarize the students about the promotion of human relations

PO 3: Provide a source of inspiration by appearing competitive exams

PO 4: Understand the emerging changes in the field of Foreign Trade and Commerce

PO 5: Acquired the knowledge about placement



# **COURSE I - RESEARCH METHODOLOGY**

**Subject code: M18COM1**

## **UNIT I**

Research: Meaning – Purpose and Types – Steps in Research – Selection and formulation of a research problem - Review of Literature.

## **UNIT II**

Research Design- Meaning and types (Case Design and Survey Design) – Sampling- Meaning, Methods and applications- Sampling techniques and Design- Sample size and Sampling errors.

## **UNIT III**

Data Collection- Methods and , Sources; Techniques questionnaire and interview schedule; Pre testing – Pilot Study – Data Processing : Meaning, Steps,- Analysis of data – Interpretation of data through SPSS – Correlation – Partial and multiple – Regression – Partial and Multiple - Time series analysis ( Problem and Theory).

## **UNIT IV**

Hypothesis – Concept, steps, sources – testing of hypothesis – Chi – Square test, ‘t’ test, ‘z’ test , ‘F’ test and ANOVA - One way and two way classification (Problem and Theory).

## **UNIT V**

Report Writing: Types of reports – contents of report – style of reporting – steps in drafting reports - Footnotes and bibliography writing; checking plagiarism.

## **COURSE OUTCOME:**

CO 1: To demonstrate the ability to choose methods appropriate to research aims and objectives

CO 2: To identify the overall process of designing a research study from its inception to its report

CO 3: To develop skills in qualitative and quantitative data analysis and presentation.

CO 4: To develop advanced critical thinking skills.

CO 5: To familiar with ethical issues in educational research, including those issues that arise in using quantitative and qualitative research.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

SEMESTER I COURSE I

### RESEARCH METHODOLOGY

**Subject code: (M18COM 1)**

MAPPING CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

M.Phil.

PO\PSO	PO1	PO2	PO3	PO4	PO5
CO					
CO-1	2	1	2	3	-
CO-2	3	2	3	2	1
CO-3	2	3	2	-	2
CO-4	3	2	2	1	-
CO-5	2	3	2	-	2
Optimum Point	2	2	2	1	1



## **COURSE II ADVANCED FUNCTIONAL MANAGEMENT**

**Subject code: M18COM 2**

### **UNIT I**

Financial Management: Objectives - Functions - capital structure – determinants – leverages – types – working capital Management.

### **UNIT II**

Human Resources Management: Objectives and Functions - Recruitment Management – Training and Development – Compensation Administration - Performance Management – Employee engagement - Strategic Human Resources Management – Global Human Resources Management – An introduction to HR metrics and analytics.

### **UNIT III**

Marketing Management: Elements - Retail Management – Customer Relationship Management – Advertisement Management – E- marketing – mobile marketing – green marketing – services marketing.

### **UNIT IV**

Portfolio Management: Capital Market – Instruments – Equities debit and derivatives – Primary Market – Issue methods. Market intermediaries – Secondary Market – Trading techniques and settlement procedures – Mutual Funds.

### **UNIT V**

Financial Institution Management – Bank Management – E-banking – payment banks including post office services – insurance management – banc assurance – co-operation management – credit management – NPA – types – challenges faced by financial institutions.

### **COURSE OUTCOME:**

**CO 1:** To analyses HRM functions, principles, Job analysis that facilitates students to design a job description and job specification for various levels of employees.

**CO 2:** To study the overall role and importance of the finance function.

**CO 3:** To understand the process of conducting marketing research and develop some solutions to real life problems.

**CO 4:** To acquire the theoretical and practical knowledge in the field of investments.

**CO 5:** To know the role and function of the financial system in reference to the macro economy.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

SEMESTER I: COURSE II

### ADVANCED FUNCTIONAL MANAGEMENT

**Subject code: (M18COM 2)**

MAPPING CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

M.Phil.

PO\CO	PO1	PO2	PO3	PO4	PO5
CO-1	2	3	2	3	1
CO-2	1	2	3	3	1
CO-3	2	2	2	1	3
CO-4	2	-	-	1	1
CO-5	3	3	3	2	1
Optimum Point	2	2	2	2	1



## COURSE III TEACHING AND LEARNING SKILLS

Subject Code: M18TLS3

### **UNIT I : Computer Application Skills**

Information and Communication Technology (ICT): Definition, Meaning, Features, Trends – Integration of ICT in teaching and learning – ICT applications: Using word processors, Spread sheets, Power point slides in the classroom – ICT for Research: On-line journals, e-books, Courseware, Tutorials, Technical reports, Theses and Dissertations-- ICT for Professional Development: Concept of professional development; institutional efforts for competency building; individual learning for professional development using professional networks, OERs, technology for action research, etc.

### **UNIT II: Communications Skills**

Communication: Definitions – Elements of Communication: Sender, Message, Channel, Receiver, Feedback and Noise – Types of Communication: Spoken and Written; Non-verbal communication – Intrapersonal, interpersonal, Group and Mass communication – Barriers to communication: Mechanical, Physical, Linguistic & Cultural – Skills of communication: Listening, Speaking, Reading and Writing – Methods of developing fluency in oral and written communication – Style, Diction and Vocabulary – Classroom communication and dynamics.

### **UNIT III: Pedagogy Instructional Technology:**

Definition, Objectives and Types – Difference between Teaching and Instruction – Lecture Technique: Steps, Planning of a Lecture, And Delivery of a Lecture – Narration in tune with the nature of different disciplines – Lecture with power point presentation - Versatility of Lecture technique – Demonstration: Characteristics, Principles, planning Implementation and Evaluation – Teaching-learning Techniques: Team Teaching, Group discussion, Seminar, Workshop, Symposium and Panel Discussion.

### **UNIT IV: E- Learning, Technology Integration and Academic Resources in India**

Concept and types of e-learning (synchronous and asynchronous instructional delivery and means), m-learning (mobile apps); blended learning; flipped learning; E-learning tools (like LMS; software's for word processing, making presentations, online editing, etc.); subject specific tools for e-learning; awareness of e-learning standards- Concept of technology integration in teaching- learning processes; frameworks guiding technology integration (like TPACK; SAMR); Technology Integration Matrix- Academic Resources in India: MOOC, NMEICT; NPTEL; e-pathshala; SWAYAM, SWAYAM Paha, National academic depository, National Digital Library; e-Sodh Sindhu; virtual labs; eYantra, Talk to a teacher, MOODLE, mobile apps, etc.

### **UNIT V: Skills of Teaching and Technology based assessment**

Teaching skills: Definition, Meaning and Nature- Types of Teaching Skills: Skill of Set Induction, Skill of Stimulus Variation, Skill of Explaining, Skill of Probing Questions, Skill of Black Board Writing and Skill of Closure – Integration of Teaching Skills – Evaluation of Teaching Skills- Technology for Assessment: Concept of assessment and paradigm shift in assessment; role of technology in assessment 'for' learning; tools for self & peer assessment (recording devices; erubrics, etc.); online assessment (open source software's; e-portfolio; quiz makers; e- rubrics; survey tools); technology for assessment of collaborative learning like blogs, discussion forums; learning analytics

**COURSE OUTCOME:**

CO 1: Develop skills of ICT and apply them in Teaching Learning context and Research.

CO 2: Develop communication skills with special reference to Listening, Speaking, Reading and Writing

CO 3: Develop adequate skills and competencies to organize seminar/conference/workshop/symposium/panel discussion.

CO 4: Develop different teaching skills for putting the content across to targeted audience.

CO 5: Appreciate the role of ICT in teaching, learning and Research.







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## PG & RESEARCH DEPARTMENT OF COMMERCE

SEMESTER I: COURSE II

TEACHING AND LEARNING SKILLS

**Subject code: (M18TLS3)**

MAPPING CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

M.Phil.

PO\CO	PO1	PO2	PO3	PO4	PO5
CO-1	3	2	2	3	1
CO-2	2	3	3	2	1
CO-3	2	1	2	-	2
CO-4	2	-	2	1	-
CO-5	3	3	3	3	1
Optimum Point	2	2	2	1	1





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## PG & RESEARCH DEPARTMENT OF COMMERCE

### M.COM - COMMERCE

#### PROGRAM OUTCOME

**PO-1:** Expose the methods of data collection and their interpretation.

**PO-2:** Develop communication and analytical skills.

**PO-3:** Impart knowledge in commerce to all students enrolled and to sensitize them on issues related to global changes and social concerns

**PO-4:** Expedite all commerce students to have wholesome personality development.

**PO-5:** Prepare and train the postgraduate students to accept the business Challenges by providing exposure on advanced commercial and business methods and processes.



# **MANAGERIAL ECONOMICS**

**Course code: P22MCCC11**

## **UNIT - I**

### **MANAGERIAL ECONOMICS:**

Managerial Economics – Meaning, Nature, Scope and Application – Relationship with other discipline – Role of Managerial Economist – Micro and Macro Economics relating to Business.

## **UNIT - II**

### **DEMAND ANALYSIS:**

Demand Analysis - Demand Schedule - Law of demand- Elasticity of demand -Indifference curve analysis - Marginal rate of substitution -Demand Determinants - forecasting and techniques.

## **UNIT - III**

### **PRODUCTION & SUPPLY:**

Production Function – Managerial use of production function - Supply analysis - Law of Supply - managerial uses of supply curve. Cost Concepts, classification & determinants – Cost Output relationship – Economics of scale - Cost Control and Cost Reduction.

## **UNIT – IV**

### **PRICE AND MARKETING STRUCTURE:**

Price and Output decisions under different marketing structures - Perfect competition, Monopoly, Oligopoly & Monopolistic Competition – Price discrimination – Pricing Objectives, policies, Strategies and methods - Price differentials – Price forecasting.

## **UNIT - V**

### **PROFIT:**

Profit – Nature & Concept – Profit Planning, Policies and Forecasting- profit theories - Measurement of profit - Interest – Rent and theories. Business Cycle and policies –Economic forecasting of business – Input Output Analysis- National Income - Accounting and Measurement.

## **COURSE OUTCOME**

**CO: 1 Learn the basic concept of Managerial Economics**

**CO: 2To know about the law of supply and cost control and cost reduction**

**CO: 3Learn price differentials and price forecasting**

**CO: 4Understand profit planning, and measurement of profit**

**CO: 5 Know about National Income, Accounting and Measurement.**





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: I

Semester: I

### MANAGERIAL ECONOMICS

Course Code: **P22MCCC11**

#### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If  
there is no correlation, put “-“

#### I MCOM

PO\CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	-	2	3	2
<b>CO-2</b>	-	2	1	2	2
<b>CO-3</b>	2	-	2	-	2
<b>CO-4</b>	2	2	-	1	-
<b>CO-5</b>	3	3	2	-	1
Optimum Point	2	1	1	1	1



# **SERVICES MARKETING**

**Course Code: P22MCCC12**

## **UNIT – I:**

Services Marketing – Definition – importance – characteristics of services – Growth of Services Marketing – Types of services – Comparative analysis between services and products.

## **UNIT – II:**

Concept of services marketing – Societal concept – Buyer behaviour concept – Factors influencing buyer behaviour – Decision making process. Delivering Quality Service - TQM in services marketing - Quality standards - process and technological requirements to implement quality standards in services marketing.

## **UNIT – III: Services Marketing**

Mix – Product Strategy – Product Life Cycle concept – Strategies during the Product Life Cycle – Product Planning Strategy – Development of new products – Diversification and Elimination.

## **UNIT – IV:**

Bank Marketing – Insurance Marketing – Transport Marketing.

**UNIT – V:** Tourism and Hotel Marketing - Education Marketing –Communication Services Marketing – Health services.

## **Course Outcome**

CO 1: Students will able to understand the comparative analysis between services and products.

CO 2: Familiarize the students to acquire TQM in services marketing

CO 3: To create the awareness and understand the product Life Cycle Concept

CO 4: Aware Bank Marketing and Insurance Marketing

CO 5: Understand Tourism and Hotel Marketing





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: I

Semester: I

### SERVICES MARKETING

**Course Code: P22MCCC12**

MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If  
there is no correlation, put “-“

I MCOM

PO\CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	3	3	2
<b>CO-2</b>	3	3	2	3	3
<b>CO-3</b>	3	2	3	3	3
<b>CO-4</b>	3	3	2	3	3
<b>CO-5</b>	3	2	3	2	3
Optimum Point	3	2	2	3	3



# ADVANCED FINANCIAL MANAGEMENT

**Subject Code: P22MCCC31**

## UNIT I

Financial Management: Meaning, nature and scope of finance; financial goal – Profit Vs Wealth Maximisation; Finance functions – investment, financing and dividend decisions.

## UNIT II

Fundamental valuation concepts: Time value of money – Compound value, Present value; Risk and Return – concept, Risk in a portfolio context, Relationship between Risk and Return. Valuation of Securities – Valuation concept – Bond Valuation – Valuation of Preference shares, Equity valuation – Dividend valuation approach, Earnings capitalisation approach and Ratio approach.

## UNIT III

Cost of capital: Meaning and Significance of cost of capital; calculation of cost of debt, preference capital, equity capital and retained earnings; combined cost of capital (weighted). Financial Leverage: Meaning, Measurement of leverages; Effect of Operating and Financial Leverage on Profit; Analysing alternate financial plans; combined financial and operating leverages.

## UNIT IV

Planning the Capital Structure – Factors influencing capital structure; EBIT-EPS Analysis, Return on Investment Analysis, Cash flow analysis, capital structure policies – Theories. Dividend policy -Factors determining dividend pay-out, Forms of dividend; stability in dividend policy; corporate dividend behaviour

## UNIT V

Management of working capital: Meaning, Significance and Types of working capital; calculating operating cycle period and estimation of working capital requirements; sources of working capital; Management of cash, receivables and inventory.

## Course Outcome

**CO 1:** Develop knowledge about Profit Vs. Wealth Maximization.

**CO 2:** Familiarize the student to acquire the knowledge of Compound value, Valuation of Preference shares.

**CO 3:** Understand cost of Capital, operating and financial leverage.

**CO 4:** Provide Factors influencing Capital Structure, Dividend Policy.

**CO 5:** Develop management of Working Capital, Management of Cash, receivables and inventory





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: I

Semester: I

### ADVANCED FINANCIAL MANAGEMENT

Course Code: P22MCCC13

#### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If  
there is no correlation, put “-“

#### I MCOM

PO\PSO CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	2	2	3
<b>CO-2</b>	-	3	2	3	3
<b>CO-3</b>	3	-	2	2	2
<b>CO-4</b>	2	3	2	2	2
<b>CO-5</b>	2	3	2	2	2
Optimum Point	2	2	2	2	2

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Dept. of Commerce  
Shrimati Indira Gandhi College  
Bengaluru - 560 009



# **PROJECT MANAGEMENT**

**Course Code: P22MCE3B**

## **UNIT I**

Project – Meaning – Nature – Types of project and project life cycle – Project management – Nature and scope of project management– Project management as a profession–Role of project manager.

## **UNIT II**

Project Identification and Formation: Project environment – Identification of investment opportunities – Projects screening – Feasibility study – Project selection – Project Formulation- Stages in project formulation – Project report preparation – Planning Commission’s guidelines for project formulation.

## **UNIT III**

Project Appraisal: Objectives, essentials of a project methodology – Market appraisal – Technical appraisal – Financial appraisal – Socio – economic appraisal – Management appraisal.

## **UNIT IV**

Project Planning and Scheduling: Objectives – Process or Planning Components or good planning – Project designing and project scheduling and time estimation – Scheduling to match availability of man power and release of funds – Cost and time.

## **UNIT V**

Project Execution and Administration – Project contracting: Contract pricing, types – Project organization: Forms of organization – Project direction – Project communication – Project coordination – Factors influencing effective project management – project time monitoring and cost monitoring – Project over runs. Project Control: Control techniques – PERT, CPM– Project audit.

## **Course Outcome**

**CO -1: Understand the students' types of projects and project life cycle.**

**CO -2:** Provide knowledge about project selection, project report preparation.

**CO -3:** Develop essentials of a project methodology.

**CO -4:** Students can go process of planning components of good planning

**CO -5:** Ability to Start project direction, project communication, project control.



**PG & RESEARCH DEPARTMENT OF COMMERCE**

Year: II

Semester: III

**PROJECT MANAGEMENT**

**Course Code: P22MCE3B**

**MAPPING**

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

(High) If there is no correlation, put “-“

**II MCOM**

PO\CO	PO1	PO2	PO3	PO4	PO5	PSO5
<b>CO1</b>	3	3	2	-	-	2
<b>CO-2</b>	2	3	3	2	3	3
<b>CO-3</b>	3	3	2	3	2	2
<b>CO-4</b>	2	3	2	-	2	2
<b>CO-5</b>	-	2	3	2	2	2
Optimum Point	2	3	2	1	2	2





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**PG & RESEARCH DEPARTMENT OF COMMERCE  
M.COM-COMMERCE**

**PROGRAM OUTCOME**

**PO-1:** Expose them Methods of data collection and their interpretation.

**PO-2:** Develop communication and analytical skills.

**PO-3:** Impart knowledge in commerce to all students enrolled and to sensitize them on issues related to global changes and social concerns

**PO-4:** Expedite all commerce students to have wholesome personality development.

**PO-5:** Prepare and train the postgraduate students to accept the business Challenges by providing exposure on advanced commercial and business methods and processes.



# HUMAN RESOURCE MANAGEMENT

Course code: P22MCCC2A

## UNIT : I

Human Resource Management- Meaning – Nature and Scope, Objectives - Functions - Distinction between HRM and Personnel Management. Personnel Policies: Procedure and Programmes .Organization of HRM Department–Needs Recent Trends in HRM Practices– Personnel Audit- Human Resource Information System need and benefits.

## .UNITII

Man Power Planning – Characteristics: Need, Process - Job Analysis Job Description- JobSpecification-JobDesign-JobEvaluationMethods–MeritsandDemerits-JobEnrichment- JobEnlargement–Re-Engineering-Recruitment–Sources-Selection-SelectionProcedure,- Interviews – Placement Induction.

## UNITIII

Training –Meaning, Need - Selection of Trainees- Methods of Training – Evaluation of Training - Management Development Programmes Methods- Promotion – Types, Merits- Demotions; Carrier Planning–Transfers.

## UNITIV

Performance Appraisal – Purpose- Factors Affecting Performance Appraisal – Criteria for Performance Appraisal–Performance Appraisal Techniques–Limitation of Appraisal Methods .Quality of Work Life–Issues in Quality of Work Life- Measuring QWL –Workers Participation in Management.

## UNITV

Grievance – Meaning, Causes of Grievance- Grievance Redressal Procedure – Collective Bargaining–Meaning–levels –methods–pre-requisites –Benefits.

## Course Outcome

CO -1: Students know and gain with in-depth knowledge of HRM

CO-2: Develop among student various practices followed by Manpower planning

CO -3: Provide Knowledge about training and Promotions

CO-4: Understand Factors affecting performance management appraisal

CO-5: Learn about Grievance, Collective Bargaining and Perquisites





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Tiruchirappalli - 620 002

## PG & RESEARCH DEPARTMENT OF COMMERCE

Year:I

Semester:II

### HUMAN RESOURCE MANAGEMENT

Course Code: P22MCCC2A

#### MAPPING

CO-PO-PO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

(High)If There Is No Correlation,put“-“

#### IMCOM

PO\PSO CO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	2	2
CO-2	3	2	2	3	3
CO-3	2	3	3	2	3
CO-4	3	3	3	2	3
CO-5	2	2	3	3	3
Optimum Point	2	2	3	2	3



## **INVESTMENT MANAGEMENT**

**Course Code: P22MCE2B**

### **UNIT I**

**Investment Management - Nature and scope - Objectives – Process – Investment Media Security and Non-security forms of Investment - gilt edged securities – Sources of Investment information.**

### **UNIT II**

**New Issues Market–Methods of Issuing –Parties involved in new issue market – Secondary market – Stock Exchanges – NSE and BSE – Trading mechanism – online trading–SEBI and Investors production.**

### **UNIT III**

**Security Analysis – Approaches – Fundamental Analysis – Technical Analysis –Dow Theory–Random Walk Theory-Efficient Market Hypothesis.**

### **UNIT IV**

**Portfolio Analysis–Traditional and Moder approach–Rationale of Diversification of Investments – Markovitz theory – Sharpe Index Model - Capital Asset Pricing Model.**

### **UNIT V**

**Investment companies in India – Types Mutual Fund Operations in India – UTI –SEBI and RBI Guide lines for Mutual Funds.**

**Note: Theory Only**

### **Course Outcome**

**CO-1: Provide knowledge about Investment and Various securities.**

**CO -2: Provide aware of new issue market and Stock Exchanges, NSE, BSE and SEBI guide lines.**

**CO-3: Impact knowledge about security Analysis and Approaches.**

**CO -4: Familiarize with the portfolio Analysis and Traditional and Modern Approach.**

**CO-5: Provide knowledge about Mutual fund operations and SEBI and RBI Guidelines.**





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year:I

Semester:II

### INVESTMENT MANAGEMENT

Course Code:P22MCE2B

### MAPPING

CO-PO-PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(Hig

h) If there is no correlation, put“-“

### II MCOM

PO\CO	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	2	3
CO-2	3	3	2	3	2
CO-3	3	2	2	3	2
CO-4	2	2	2	2	2
CO-5	2	2	2	2	3
Optimum Point	2	2	2	2	2



# **RESEARCH METHODOLOGY**

**Course Code: P22MCCC21**

## **UNIT I**

**Research in Management: An Introduction – Definition, meaning and nature – Scope and objects of Research. Types of Research: Experimental Research – Survey Research – Case Study methods – Ex Post Facto Research.**

## **UNIT II**

**Research Design – Defining Research Problem and Formulation of Hypothesis – Experimental Designs.**

## **UNIT III**

**Research Process – Steps in the process of Research, Data Collection and Measurement: Sources of Secondary data – Methods of Primary data collection – Questionnaire construction – Attitude measurement and Scales – Sampling and Sampling Designs – Philosophy and Pre-testing.**

## **UNIT IV**

**Data presentation and Analysis – Data Processing – Methods of Statistical analysis and interpretation of Data – Testing of Hypothesis and theory of inference.**

## **UNIT V**

**Report writing and presentation –steps in Report writing - types of reports – Substance of Reports – Formats of Reports – Presentation of a Report - Documentation - Foot Note - Bibliography**

## **Course Outcome**

**CO 1: Students will understand and create with the areas of Business Research Activities.**

**CO 2: Enhance capabilities of students to conduct Research design and formulation of Hypothesis**

**CO 3: Facilitate students in developing the most appropriate methodology for their research studies**

**CO 4: Develop knowledge about to Interpretation of data and testing of Hypothesis**

**CO 5: Aware the students ready to write report and presentation**







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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: I

Semester: II

### RESEARCH METHODOLOGY

Course Code: P22MCCC21

#### MAPPING

CO-PO-PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

h) If there is no correlation, put“-“

#### I MCOM

PO\CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3
CO-2	1	2	3	3	3
CO-3	3	3	3	2	3
CO-4	3	2	3	2	2
CO-5	3	2	2	2	3
Optimum Point	2	2	2	2	3



# **INCOME TAX THEORY LAW AND PRACTICE**

**Course Code: P22MCCC23**

## **UNIT I**

**Income Tax Act – Definition – Income – Agriculture Income – Assesses – Previous year – Assessment year – Residential Status – Scope of Total Income – Capital and Revenue – Receipts and Expenditure – Exempted Incomes.**

## **UNIT II**

**Computation of Income from Salaries and Income from House Property.**

## **UNIT III**

**Computation of Profits and Gains of Business or Profession – Computation of Capital Gain - Computation of Income from other sources.**

## **UNIT IV**

**Set-off and Carry Forward of Losses – Deduction from Gross Total Income – Computation of Tax Liability.**

## **UNIT V**

**Income Tax Authorities – Procedure for Assessment – Tax Deducted at Source (TDS) – Assessment of Individuals, Hindu Undivided Family, Partnership Firms and Companies.**

### **Course Outcome**

**CO -1: Provide understanding of Income Tax Act, Residential Status and Exempted Income.**

**CO -2: Understand Income from Salaries and House Property practices.**

**CO -3: Gain knowledge about to computation of Business or Profession and Capital Gain and Other Sources.**

**CO -4: Understand Deduction from Gross Total Income.**

**CO -5: Provide knowledge of Tax deducted at source**





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year:I

Semester:II

### INCOME TAX LAW & PRACTICE

Course Code: P22MCCC23

### MAPPING

CO-PO-PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

h)If There Is No Correlation, put“-“

### IMCOM

PO\CO	PO1	PO2	PO3	PO4	PO5
CO-1	2	-	1	-	-
CO-2	-	-	2	-	-
CO-3	2	1	-	-	2
CO-4	1	2	3	2	-
CO-5	-	3	-	3	3
Optimum Point	1	1	1	1	1

# **STRATEGIC MANAGEMENT**

**Course code: P22MCCC41**

## **UNIT – I**

### **INTRODUCTION TO STRATEGIC MANAGEMENT :**

nature, scope, and importance of strategy; and strategic management (Business policy). Strategic decision-making. Process of strategic management and levels at which strategy operates. Role of strategists.

### **UNIT – II DEFINING STRATEGIC INTENT:**

Vision, Mission, Business definition, Goals and Objectives. Internal Appraisal – The internal environment, organizational capabilities in various Functional areas and Strategic Advantage Profile. Methods and techniques used for organizational appraisal (Value chain analysis, Financial and non-financial analysis, historical analysis, Industry standards and benchmarking, balanced scorecard and key factor rating). Identification of Critical Success Factors (CSF).

### **UNIT - III SWOT ANALYSIS:**

Environmental Appraisal- Concept of environment, components of environment (Economic, legal, social, political and technological). Environmental scanning techniques- ETOP, QUEST and SWOT (TOWS). Corporate level strategies-- Stability, Expansion, Retrenchment and Combination strategies. Corporate restructuring. Concept of Synergy. Business level strategies Porter's framework of competitive strategies; Conditions, risks and benefits of Cost leadership, Differentiation and Focus strategies. Location and timing tactics. Concept, Importance, Building and use of Core Competence.

### **UNIT - IV INDUSTRY LEVEL ANALYSIS:**

Strategic Analysis and choice—Corporate level analysis (BCG, GE Nine-cell, Hofer's Product market evolution and Shell Directional policy Matrix). Industry level analysis: Porters' five forces model. Qualitative factors in strategic choice.

### **UNIT - V STRATEGY IMPLEMENTATION:**

Resource allocation, Projects and Procedural issues. Organization structure and systems in strategy implementation. Leadership and corporate culture, Values, Ethics and Social responsibility. Operational and derived functional plans to implement strategy. Integration of functional plans. Strategic control and operational Control. Organizational systems and Techniques of strategic evaluation.

## **COURSE OUTCOME:**

CO-1 Provide understanding of the Tasks, Functions and Skills of strategic management and latest developments

CO-2 Provide practice for SWOT Analysis, Social responsibility and Business Ethics

CO-3 Develop an understanding of Strategy formulation portfolio analysis

CO-4 Ability to Strategy Implementation, Growth Strategies

CO-5 Develop ideas and innovation of strategies Effectiveness.



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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: IV

### STRATEGIC MANAGEMENT

Course Code: P22MCCC23

#### MAPPING

CO-PO-PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial

(High)If there is no correlation, put“-“

#### II MCOM

PO\CO	PO1	PO2	PO3	PO4	PO5
CO-1	2	2	1	-	-
CO-2	2	3	-	1	2
CO-3	2	3	1	2	2
CO-4	3	2	2	2	2
CO-5	3	2	2	3	3
Optimum Point	2	2	1	1	1



## ENTREPRENEURSHIP DEVELOPMENT

Course Code: P22MCIBC

### UNIT – I

Concept of Entrepreneurship – Meaning –Definition – Characteristics – Functions – Role of Entrepreneurs in the economic development – Classification of entrepreneurs – Factors affecting entrepreneurial growth.

### UNIT – II

Entrepreneurship Development Programmes –Meaning, Objectives- Stages. Sources of Business ideas – Project identification – Project formulation – Project Report- Project appraisal - Technical- Commercial appraisal.

### UNIT – III

Demand forecasting – Sources of market information – Financial appraisal – Capital cost of project – Sources of finance – Financial problems.

### UNIT – IV

Financing of trade – domestic and foreign – loans and advances – type – secured and unsecured – securities - documentation – procedures syndicated advance – participation – project financing.

### UNIT – V :

Role of promotional & Consultancy organizations- Incentives and subsidies of State and Central Govt. – Aims – Backward areas – Industrial Estates – DICs –Role of financial institutions in the entrepreneurial growth.

### **COURSE OUTCOME:**

**CO-1** Familiarizes students with business planning in different types of entrepreneurs and the evolving concepts of entrepreneurship.

**CO-2** Enhances the Entrepreneurial abilities of the students and develops creativity for better functioning of the organization.

**CO-3** To create the knowledge about the start-up process of new business, project identification and selection of the project.

**CO-4** Provides the overall view of institutional finance to entrepreneurs.

**CO-5** Students to know about the incentives and subsidies for entrepreneurs and benefit to SSI and role of entrepreneurs.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: IV

### ENTREPRENEURIAL DEVELOPMENT.

Subject code: P22MCIBC

#### MAPPING

CO-PO-PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

h)If there is no correlation ,put“-“

#### II MCOM

PO \ CO	PO1	PO2	PO3	PO4	PSO5
CO-1	3	1	-	2	2
CO-2	2	-	2	-	2
CO-3	3	3	3	2	-
CO-4	3	2	3	2	2
CO-5	3	3	2	2	2
Optimum Point	3	2	2	1	1





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Tiruchirappalli - 620 002

## PG & RESEARCH DEPARTMENT OF COMMERCE

### B.COM., COMPUTER APPLICATIONS

#### PROGRAMME OUTCOME

PO1: Understand the application of business Knowledge in both theoretical and practical aspects.

PO2: Ability to apply knowledge of Mathematical Foundations in computing problems.

PO3: Determine the procedures and schedules to be followed on preparing financial statements of Companies.

PO4: Ability to understand the Software concepts and their applications.

PO 5- Enter master programmes like M.Com, MBA and pursue professional programmes like C.A, CMA, C.S, etc.

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**Course Course MANAGEMENT CONCEPT**  
**Subject code: 22CCCCA3**

**UNIT I**

Management – Definition, nature, scope, functions and Levels of Management-Art, Science and Profession - functions of Managers- Development of management thought – Contribution by F.W.Taylor, Henry Fayol and others.

**UNIT II**

Planning –Classification – Objectives – characteristics-Steps - process- types- Methods advantages - limitations, Decision making – Policies.

**UNIT III**

Organization and Structure– Types – Supervision and Span of Control - Departmentation – Organization charts – Authority and Responsibility- Delegation and Decentralization.

**UNIT IV**

Motivation - types -Theories – Maslow, Herzberg, McGregor, and others. Communication - Principles - types and barriers of communication.

**UNIT V**

Leadership –functions - styles - theories. Coordination – features – types and techniques. Control- process- effective control system - Techniques of control. MBO.

**COURSE OUTCOME:**

**CO1:** Creates understanding of the concept of management along with evolution of management, functions and levels of management.

**CO2:** To understand the planning and process of planning methods and advantages, of planning.

**CO3:** Provides the students' knowledge about the organization and structure, departmentation and authority and responsibility.

**CO4:** To create the knowledge about the motivation, motivation process and theories of motivation.

**CO5:**To create the knowledge about the motivation, motivation process and theories of motivation.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year:I

Semester: II

Course : MANAGEMENT CONCEPT

Subject code: 22CCCA3

MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

(High) If there is no correlation, put “-“

I BCOM CA

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	-	2	2	3
CO2	2	2	2	2	3
CO3	3	2	2	3	3
CO4	3	2	3	2	3
CO5	2	3	-	-	2
Optimum Point	3	2	2	2	3

  
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## **CORE COURSE IV INTERNET AND WEB APPLICATION**

**Subject code:**

### **Unit I :**

Introduction to Internet – A brief History of Internet – Use of Internet – Connection to the Internet – web pages – Web Pages come from the web server – Web sites – The normal Modem – ISDN, ADSL, CABLE Modems – Introduction to Bluetooth and Wi-Fi.

### **Unit II:**

Internet Service Provider – Dialer Programs and Internet Programs – Internet Explorer – Netscape – Netscape navigation – Animation – Frames: Several Web pages at one – Several windows simultaneously – Printing.

### **Unit III:**

Internet Basics: Evolution – Basic Terminology – Getting into the net – Browsers – Applications of Internet – Introduction to internet protocols – Language of Internet. E-mail and voice mail – Creating mail address – Meaning of Net Meeting and Chatting – Tool bar.

**Practical 40 marks (UE: 30 marks IA:10marks)**

### **Unit IV:**

E-mail address – creation – browsing – search engines –downloads

### **Unit V:**

Visiting business places, libraries, Railway and Airline reservation, online chatting

### **COURSE OUTCOME:**

**CO1:** Understand the client-server model of Internet programming works.

**CO2:** Design and develop interactive, client-side, executable web applications.

**CO3:** Demonstrate how Internet programming tasks are accomplished.

**CO4:** Build tools that assist in automating data transfer over the Internet.

**CO5:** Compare the advantages and disadvantages of the core Internet protocols





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Year: I

Semester: II

## CORE COURSE IV INTERNET (WITH PRACTICALS)

(Theory & Practical)

Subject code: 16CCCA4

### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

(High) If there is no correlation, put “-“

### IBCOM CA

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2
CO2	2	2	2	2	3
CO3	2	2	3	3	2
CO4	3	2	3	2	3
CO5	2	3	-	-	2
Optimum Point	2	2	2	2	2

  
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## **ALLIED COURSE II PC PACKAGES II (Theory & Practical)**

**Subject code: 22CFACCA1P**

### **Unit I :**

MS Access – Introduction – Parts of Access Window, Creating a Database, Relationships, Creating Table through Design View – Relationship – Query – Forms – reports - macros.

### **Unit II:**

Page Maker – Menu – File, Edit, Utilities, Layout, Story, Type, Element, Window, Help –Working with Page Column – Indent.

### **Unit III:**

Photoshop – The Photoshop Screen – Using the Toolbox – Document and scratch Sizes – The Info Palettee – Saving and loading custom settings –opening and saving files – Images – Layers – Channels and Mask – Colour Correction Techniques – Animation.

**(Practical – 40 marks UE: 30 marks IA: 10 marks)**

### **Unit IV:**

Creation of Database – Creation of relationships – Creating tables through design view – Database for salary, Mark Sheet, Inventory, Form creation.

### **Unit V:**

Photoshop – Saving and loading custom settings – Creating new file – Use of painting tools – Copying a pasting selection – Moving selections – Grow and similar command – Editing Points – Use of Color Balance Dialogue box.

### **COURSE OUTCOME:**

CO1: To understand basic computer concepts and various problem-solving methods, including word processing

CO2: To enable the students to have thorough knowledge of computer hardware, software, its components and operating system.

CO3: To provide basic conceptual knowledge about the computer systems and information- technology Objectives

CO4: To know about Calculations using Spreadsheet applications and Data storage using Database management

CO5: To know how to use a browser, including loading URL moving to other pages, saving pages, graphics, using e- mail and search engines.





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Year: I

Semester: II

## ALLIED COURSE II :PC PACKAGES II

Subject code: 22CFACCA1P

### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

(High) If there is no correlation, put “-“

### I BCOM CA

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	-	2
CO2	3	2	2	2	3
CO3	2	-	2	3	2
CO4	3	2	3	2	2
CO5	2	3	-	1	2
Optimum Point	2	2	2	2	2

  
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## **CORE COURSE – VI BUSINESS TOOLS FOR DECISION MAKING**

**Subject code: 22CCCA6**

### **Unit - I**

Introduction – Meaning, Characteristics, Stages and Uses of Statistics – Classification and Tabulation – Diagrams and graphs – Bar and Pie diagrams – Graphs of one and two variables – Graphs of frequency distribution - Measure of central tendency – Arithmetic mean, Median, Mode, Geometric Mean and Harmonic mean.

### **Unit - II**

Measures of Dispersion – Range – Quartile deviation – Mean deviation – Standard deviation – Coefficient of variation - Measurement of Skewness (Karl Pearson & Bowley methods only)

### **Unit - III**

Correlation – Simple correlation – Karl Pearson’s coefficient of correlation – Spearman’s rank correlation – Concurrent deviation method - Regression analysis – Simple regression – Regression equations.

### **Unit – IV**

Analysis of Time series – Components – Methods – Semi average – Moving average - Method of least square – Interpolation – Meaning, Uses, Assumptions – Newton’s method only.

### **Unit - V**

Index numbers – Price index numbers – unweighted and weighted – Tests in index numbers (Time and factor reversal tests only) - Cost of living index number – Aggregate expenditure method – Family budget method.

### **COURSE OUTCOME:**

**CO1:** Depth of knowledge in algebra, analysis, or statistics.

**CO2:** Students will formulate complete, concise, and correct mathematical proofs.

**CO3:** Students will frame problems using multiple mathematical and statistical representations of relevant structures and relationships and solve using standard techniques.

**CO4:** Analyze statistical data using measures of central tendency, dispersion and location.

**CO5:** Use the basic probability rules, including additive and multiplicative





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: IV

### BUSINESS TOOLS FOR DECISION MAKING

Subject code: 22CCCM4

### MAPPING

#### CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put

#### II BCOM

PO/CO	PO1	PO2	PO3	PO4	
CO1	3	3	3	3	3
CO2	3	3	2	2	2
CO3	2	3	3	2	3
CO4	3	2	3	3	3
CO5	2	2	3	2	2
<b>Optimum Point</b>	3	2	3	2	2





## **CORE COURSE VII COST ACCOUNTING.**

**Subject code: 22CCCA7**

### **Unit – I**

Definition, Scope and nature of cost accounting – cost concepts – classification – objectives and advantages – demerits of cost accounting – methods and techniques – cost unit – cost centers – cost sheet.

### **Unit – II**

Materials cost – purchase procedure – stores procedure – receipt and issue of materials – storage organization and layout – Inventory control – levels of stock, perpetual inventory. ABC Analysis, EOQ – Stores ledger – pricing of material issues, FIFO, LIFO, Simple Average & Weighted Average.

### **Unit – III**

Labour cost – Time recording and time booking – methods of remuneration and incentive schemes – overtime and idle time – labor turnover - types – causes and remedies.

### **Unit – IV**

Overheads – collection, classification, allocation, apportionment, absorption – recovery rates – Over & Under absorption – cost sheet and cost reconciliation statement.

### **Unit – V**

Job costing, Contract costing, Process costing (Normal loss, Abnormal loss and gains only) – operating costing

### **COURSE OUTCOME:**

CO1: Enable the students to understand critical concepts related to cost sheet

CO2: Provide the students necessary knowledge to compute inventory control and stocks using different methods

CO3: To give an exposure on computation of wage rates

CO4: To provide critical understanding on time rate and piece rate systems

CO5: To offer the students necessary knowledge on over heads and related allocations





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Year: I

Semester: II

## CORE COURSE – VII COST ACCOUNTING.

Subject code: 22CCCA7

### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

(High) If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3
CO2	2	2	3	2	2
CO3	3	3	2	-	3
CO4	3	2	3	2	2
CO5	3	3	2	3	2
Optimum Point	3	3	2	2	2

  
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## **CORE COURSE –VIII VISUAL PROGRAMMING**

**Subject code: 22CCCA10**

### **UNIT- I:**

Introduction to Visual Basic, Integrated development environment features – Forums – Controls – Events – Methods – Properties - Uses of Property Window – Code Window (Code Behind File) – Variable declaration.

### **UNIT-II:**

Scope of Variables – Constant – Array – Loops in Visual Basic: For ... Next, While, Do... While - Select statements: if...end if - if...else if...end if - Select...Case End Case –

### **UNIT-III:**

Standard Controls: Form - Text Box – Command Button – Label Box – Check Box – Frame Control – Combo Box – List Box – Radio Button - Image Control - Picture Box – Timer.

### **UNIT-IV:**

File System – Drive, List, File List Box – Introduction to Built-in-Active X control tool bar – Tree view – Menu Editor – Command dialog control – Rich Text Box.

### **UNIT-V:**

Introduction to Database – MS Access – Data Grid (Accessing Data Base data) – Open data base connectivity – Introduction to Dot Net: IDE – Execution Procedures – CLR – CTS.

### **COURSE OUTCOME:**

**CO1:** Provide understanding on Visual programming.

**CO2:** Enable the students apprehend the displaying information

**CO3:** State the advantages of DBMS

**CO4:** Provide them critical analysis of queries.

**CO5:** To learn how to create forms and labels





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Year: I

Semester: II

## CORE COURSE –VIII VISUAL PROGRAMMING

Subject code: 22CCCA10

### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

(High) If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3
CO2	2	2	3	2	2
CO3	3	3	2	-	3
CO4	3	2	3	2	2
CO5	3	3	2	3	2
Optimum Point	3	3	2	2	2

  
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## **CORE COURSE – XIII MANAGEMENT ACCOUNTING**

**Subject code: 22CCCCA11**

### **Unit - I**

Management accounting – Definition – Objectives – Nature – Scope – Merits and limitations – Differences between management accounting and financial accounting – Financial statement analysis – Comparative statement – Common size statement – Trend percentage – Ratio analysis – Meaning – Classification – Liquidity, solvency, turnover and profitability ratios – Dupont chart – Construction of balance sheet.

### **Unit - II**

Fund flow statement – Meaning – Preparation – Schedule of changes in working capital – Funds from operation – Sources and applications – Cash flow statement – Meaning – Difference between fund flow statement and cash flow statement – Preparation of cash flow statement as per Accounting Standard 3.

### **Unit - III**

Budget and Budgetary control – Meaning – Advantages – Preparation of sales, production, production cost, purchase, overhead cost, cash and flexible budgets - Standard costing – Meaning, Advantages and Limitations.

### **Unit - IV**

Variance analysis – Significance - Computation of variances (Material and Labour variance only) - Marginal costing – CVP analysis – Break even analysis – BEP - Managerial applications – Margin of safety – Profit planning.

### **Unit - V**

Capital Budgeting – Meaning – Importance – Appraisal methods – Payback period — Accounting rate of return - Discounted cash flow – Net present value – Profitability index – Internal rate of return.

### **COURSE OUTCOME:**

**CO1:** Make the students aware of introduction to management accounting

**CO2:** To Gain knowledge on fund flow and cash flow analysis.

**CO3:** To Enable them to analyses the financial statements using ratios

**CO4:** To Understand the importance of budgetary control

**CO5:** To Apprehend the students to make decision using capital budgeting tools.





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Tiruchirappalli - 620 002

Year: III

Semester: VI

## CORE COURSE – XIII MANAGEMENT ACCOUNTING

Subject code: 22CCCA11

### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

(High) If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3
CO2	2	2	3	-	2
CO3	3	2	2	3	3
CO4	3	2	2	-	2
CO5	2	2	3	2	2
Optimum Point	2	3	2	1	2

  
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**CORE COURSE – XIV INCOME TAX THEORY LAW & PRACTICE**

**Subject code 22CCCA13**

**Unit - I**

Basic concepts – Definition - previous year –assessment year – person, assesses, income, total income, casual income, capital and revenue - residential status and incidence of tax, incomes exempt under section 10.

**Unit- II**

Salary – Basis of charge – different forms of salary, allowances, perquisites and their valuation – deduction from salary –Computation of taxable salary.

**Unit- III**

House property – basis of charge – determination of annual value - GAV, NAV – income from let-out property – self occupied property – deductions-Computation of taxable income.

**Unit- IV**

Profits and gains of business and profession – basis of charge – methods of accounting – deductions – dis allowances, Computation of taxable income.

**Unit - V**

Capital gains – basis of charge – short- and long-term capital gains – indexed cost of acquisition and improvement – exemptions – chargeability of short- and long-term capital gains – computation of taxable capital gains. Income from other sources – interest on securities, etc. deduction under Sec 80C – Introduction to direct taxes code.

**COURSE OUTCOME:**

CO1: Introduce the concepts related to income tax

CO2: To Understand the different forms of incomes for individuals

CO3: To Create an idea about income which are generated from house property

CO4: To Make the students aware of assessment made for individuals

CO5: To Empowers the Practical exposure on income tax provisions.





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Year: III

Semester: VI

## CORE COURSE – XIV INCOME TAX THEORY LAW & PRACTICE

Subject code 22CCCCA13

### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

(High) If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	-	2
CO2	2	2	2	2	-
CO3	2	3	3	2	2
CO4	2	2	2	-	2
CO5	2	2	2	2	2
Optimum Point	2	2	2	1	1



## **CORE COURSE – XV COMPUTERISED ACCOUNTING**

### **Subject code: 22CMBECA4**

#### **Unit - I**

Accounting packages: computerized accounting – meaning and features – advantages and disadvantages – computerized vs manual accounting – creating of company – grouping of accounts – creation accounts and inventory – entering transactions: Vouchers – types – numbering – deleting and editing vouchers – opening and closing balances – stock valuation.

#### **Unit - II**

Computerized accounting: computers and financial application, accounting software packages. An overview of computerized accounting system – salient features and significance, concept of grouping of accounts. Codification of accounts, maintaining the hierarchy of ledger, generating accounting reports.

#### **Unit - III**

Introduction of tally: starting tally – gateway to tally and exit from tally: company creation in tally, saving the company profile. Alteration / deletion of company, selection of company; account groups and ledgers hierarchy of account groups and ledgers, reserved account groups, account groups balance sheet – account groups of liabilities, account groups of assets account groups of profit & loss account – account groups of direct income and direct expenses apart from sale and purchases, indirect income and indirect expenses account masters – account groups creation and account ledgers creating feeding of opening balances alteration / deletion of account master records feeding of closing stock value

#### **Unit - IV**

Reports: petty cash book – trial balance – profit and loss account – balance sheet – group wise - accounts wise – data range reports – preparation of departmental accounts – preparation of bank accounts – bank reconciliation statement – stock reports – budget variance reports – transactions list – accounts list.

#### **Unit - V**

Tax accounting: value added tax (VAT): VAT register, VAT reports – service tax: service tax register, service tax reports – MS-Excel – introduction – menus, commands, toolbars and their icons – functions.

**COURSE OUTCOME:**

**CO1:** Apply accounting procedures using specialized computer accounting software.

**CO2:** Communicate effectively using standard accounting terminology.

**CO3:** Demonstrate an understanding of accounting reports and records.

**CO4:** To prepare accountants to process more information than before by creating accurate financial reports.

**CO5:** To improve inventory control and collection, saving time and improving cash flow.





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Year: III

Semester: VI

## CORE COURSE – XV COMPUTERISED ACCOUNTING

Subject code: 22CMBECA4

### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial

(High) If there is no correlation, put “-“

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2
CO2	3	2	2	2	3
CO3	2	3	3	3	2
CO4	3	-	2	-	2
CO5	3	3	-	2	2
Optimum Point	3	2	2	2	1

  
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Tiruchirappalli - 620 003

## PG & RESEARCH DEPARTMENT OF COMMERCE

### B.COM., COMPUTER APPLICATIONS

#### PROGRAMME OUTCOME

PO1: Understand the application of business Knowledge in both theoretical and practical aspects.

PO2: Ability to apply knowledge of Mathematical Foundations in computing problems.

PO3: Determine the procedures and schedules to be followed on preparing financial statements of Companies.

PO4: Ability to understand the Software concepts and their application

PO 5- Enter master programmes like M.Com, MBA and pursue professional programmes like C.A, CMA, C.S, etc.

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## **CORE COURSE I – PRINCIPLES OF ACCOUNTANCY**

**Subject Code: 22CCCA1**

Unit I:

Introduction – Accounting concepts and conventions –Accounting Standards – Meaning - Double entry system – Journal, Ledger, Subsidiary books, Trial Balance- Bank Reconciliation Statement.

Unit II:

Final Accounts of sole traders with adjustment entries - Rectification of Errors.

Unit III

Accounts of Non-profit organization – Bills of exchange – Average due date – Account Current.

Unit IV

Consignments and Joint Ventures.

Unit V:

Single Entry System. Depreciation - Methods, provisions and reserves.

### **COURSE OUTCOME:**

CO1: Use the accounting cycle to develop financial statements from business transactions.

CO2: Demonstrate an understanding of the principles of internal control and apply them to relatively straightforward situations to identify strengths and weaknesses.

CO3: Describe the purpose of accounting and explain its role in business and society.

CO4: Demonstrate an understanding of inventory, receivables, long-lived assets, liabilities, and stockholder's equity and recommend appropriate accounting treatment.

CO5: Describe how basic business economic events affect accounts and financial statements.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: I

Semester: I

**Subject Code: 22CCCA1**

### CORE COURSE I – PRINCIPLES OF ACCOUNTANCY

#### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

#### I BCOM CA

PO \ CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	3	2	3	2
<b>CO2</b>	3	3	2	2	2
<b>CO3</b>	3	3	2	3	3
<b>CO4</b>	2	3	3	2	2
<b>CO5</b>	2	1	3	1	2
<b>Optimum Point</b>	3	3	2	2	2

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## **Core Course MARKETING**

**Subject code: 22CCCCA2**

### **Unit I:**

Definition and meaning of marketing – Modern concept of Marketing – Marketing and selling – Marketing functions – buying transportation – warehousing – standardization – Grading – Packaging

### **Unit II:**

Buyer's behavior – Buying motive – Market segmentation – Marketing strategies – product development -, introduction of new product – branding – packaging brand loyalty – product life cycle.

### **Unit III:**

Pricing methods and strategies – physical Distribution – wholesaler and retailer – Services rendered by them.

### **Unit IV:**

Promotional methods – Advertising – Publicity – Personal selling – Sales Promotion

### **Unit V:**

Marketing Research – importance in Marketing decisions – Interactive marketing – Use of Internet – Online auction – Recent.

### **COURSE OUTCOME:**

CO1: To demonstrate strong conceptual knowledge in the functional area of marketing

CO2: Students will demonstrate effective understanding of relevant functional areas of marketing and its application

CO3: Students will demonstrate analytical skills in identification and resolution of problems pertaining to marketing.

CO4: To learn about marketing process for different types of products and services.

CO5: To know about the marketing research and marketing information system.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: I

Semester: I

**Subject Code: 22CCCA2**

### CORE COURSE II – MARKETING

#### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

I BCOM CA

PO \ CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	2	2	2	2
<b>CO2</b>	3	-	2	1	2
<b>CO3</b>	3	2	2	2	2
<b>CO4</b>	3	2	2	2	2
<b>CO5</b>	2	-	2	2	2
<b>Optimum Point</b>	3	1	2	2	2

  
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**PC PACKAGES-I**  
**Subject code: 22CFCCA1**

**Unit I:**

Introduction to computers – Meaning – Characteristics – Areas of Application – Components of Computer – Memory and control units – Input and Output devices – Hardware and Software – Operating Systems

**Unit II:**

Word – Creating Word Documents – Creating Business Letters using wizards – Editing Word Documents – Inserting Objects – Formatting documents –spelling and grammar check – Word Count, Thesaurus, Auto Correct – Working with tables – Saving, opening, closing and protecting documents – Mail Merge.

**Unit III:**

Introduction to Spread Sheet (MS –Excel) – Introduction to spread sheets – entering and editing text, numbers and formulae – Inserting rows and columns Building Worksheets – Creating and formatting charts – Application of Financial and Statistical functions – MS Power Point Creating a simple presentation – Creating, inserting and deleting slides – Saving a Presentation.

**(Practical – 40 marks UE: 30 marks IA: 10 marks)**

**Unit IV:**

Word – Creating personal letters – Official letters – circulars – templates – Use of Wizards – Resumes – Preparation of Bio-data – Creating Greetings – Clip Art – Bullets and Numbering – Insertion of charts and diagrams – Tables – Mail merge.



## **Unit V:**

Excel – Entering information in worksheet - Sum functions – Align data cells – Changing column width and row height – Pay bill – mark sheet – Electricity bill – Pay slip – PowerPoint – Simple presentations – creating slide show – animation – inserting and deleting slides.

### **COURSE OUTCOME:**

CO1: Make the students understand about office automation.

CO2: Create basic knowledge in using MS Word

CO3 Make them aware of various features in Excel

CO4: Help them apprehend the overall application of PPT for presentation

CO5: To knowledge on the application of MS Access





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: I

Semester: I

### CORE COURSE PC PACKAGES-I

**Subject code: 22CFCCA1**

#### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

#### I BCOM CA

PO \ CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	3	2	3	3
<b>CO2</b>	3	2	2	-	2
<b>CO3</b>	3	2	2	-	2
<b>CO4</b>	3	2	3	-	2
<b>CO5</b>	3	2	2	-	2
<b>Optimum Point</b>	3	2	2	-	2

  
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**CORE COURSE – V FINANCIAL ACCOUNTING**  
**Subject code: 22CCCCA5**

**Unit – I**

Branch accounts (excluding foreign branches) – Departmental accounts

**Unit – II**

Hire Purchase accounts – Royalty accounts.

**Unit – III**

Admission and Retirement of a partner, Death of a partner.

**Unit – IV**

Dissolution of firm – piecemeal distribution.

**Unit – V**

Insurance claims for loss of stock and profits – insolvency accounts – statement of affairs – insolvency of individual only.

**COURSE OUTCOME:**

CO1: Understand key concepts of Branch accounts

CO2: Understand the need and essentials of Departmental accounts.

CO3: Preparing accounts based on Hire Purchase and Installment system.

CO4: Prepare accounts using admission, death and retirement of partners T

CO5: To Understand the importance of financial standards and regulatory reporting





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PG & RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: III

## CORE COURSE – V FINANCIAL ACCOUNTING

Subject code: 22CCCA5

### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### II BCOM CA

PO \ CO	PO1	PO2	PO3	PO4	PO5
C01	2	3	3	2	3
C02	2	2	2	2	2
C03	2	2	2	-	2
C04	3	2	3	-	2
C05	3	3	2	3	2
Optimum Point	2	2	2	1	2

  
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**Course cores BUSINESSLAWS**

**Subject code: 22CSACCA1**

**UNIT- I**

Introduction – Definition and scope of mercantile law – growth and sources of mercantile law – Nature and kinds of contracts – offer and acceptance – consideration – capacity of parties–free consent–legality of object and of consideration, Void Agreements–contingent contracts

**UNIT- II**

Performance of contracts–Discharge of contracts–remedies for breach including specific performance – Quasi contracts.

**UNIT- III**

Indemnity and Guarantee–Bailment and pledge–Agency.

**UNIT- IV**

Laws of sale of Goods

**UNIT- V**

Law of Negotiable Instruments.

**COURSE OUTCOME:**

**CO1:** Provides a brief idea about the mercantile law, nature and kinds of contract, of fer and acceptance.

**CO2:** To understand the performance of contracts and discharge of contracts

**CO3:** Provides the knowledge towards indemnity and guarantee, bailment and pledge.

**CO4:** Know about the law of sale of Goods, sale and agreement to sell, conditions and warranty.

**CO5:** To know about negotiable instruments understand then votes, bills, cheques and promissory note



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## PG& RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: III

Subject Code: 22CSACCA1

CORECOURSEI–BUSINESSLAWS

### MAPPING

#### CO -PO –PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

If there is no correlation, put

### II BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5	PSO5
CO1	3	3	2	2	3	2
CO2	2	2	3	2	2	2
CO3	2	3	2	2	2	2
CO4	2	2	3	3	2	-
CO5	3	2	3	3	2	3
Optimum Point	2	2	3	2	2	1

  
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**CORE COURSE – IX CORPORATE ACCOUNTING**  
**Subject code:22CCCA8**

**Unit – I**

Company accounts – introduction – legal provisions regarding issue of shares, application, allotment, calls, calls-in-arrears, calls-in-advance, issue of shares at premium- issue of shares at discount- forfeiture of shares - re-issue – accounting entries.

**Unit – II**

Issue and redemption of debentures – methods of redemption of debentures- instalment – cum-interest and Ex-interest – redemption by conversion, sinking fund, insurance policy. Redemption of preference shares- implication of Section 80 and 80A of the Companies Act.

**Unit – III**

Amalgamation – purchase consideration- accounting treatment – pooling of interest method and purchase method, Absorption, external and internal reconstruction of companies.

**Unit – IV**

Accounts of Holding company - legal requirements relating to presentation of accounts - Consolidation of balance sheet (excluding chain holding).

**Unit – V**

Final accounts of banking companies (new format) and Insurance companies (new format).

**COURSE OUTCOME:**

CO1: Enabling the students to understand the features of Shares and Debentures

CO2: Develop an understanding about redemption of Shares and Debenture and its types

CO3: To give an exposure to the company final accounts

CO4: To provide knowledge on valuation of Goodwill

CO5: To provide the students get an idea about internal reconstruction







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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: III

Semester: V

### CORE COURSE – IX CORPORATE ACCOUNTING

Subject code:22CCCA8

#### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

#### III BCOM CA

PO \ CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	3	3	2	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	2	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	2	2	2	3	3
<b>Optimum Point</b>	3	3	2	3	3

  
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**CORE COURSE – X AUDITING**  
**Subject code: 22CMBECA1**

**Unit – I**

Introduction – definition of audit – objects of audit – classification of audit – Internal audit – Periodical audit – Continuous audit – Interim audit – Balance sheet audit. Internal check – Internal control. Procedure of audit – audit programme – test check – Auditing vs. Investigation.

**Unit – II**

Vouching – cash and trading transactions, personal and impersonal ledgers.

**Unit – III**

Valuation and Verification of assets and liabilities. Depreciation and Reserves – Auditors duties regarding Depreciation and Reserves.

**Unit – IV**

Audit of Limited companies – share capital audit – share transfer audit – appointment, qualification, rights and liabilities of company auditors – Audit reports.

**Unit – V**

Divisible profits and Dividends – Audit of computerized Accounting.

**COURSE OUTCOME:**

CO1: Understand the environment and types relating to the auditing function

CO2: Identify the steps needed to prepare for an audit

CO3: Understand general audit terminology and plan an audit taking into account concepts of evidence, risk and materiality

CO4: Know the steps for performing an audit

CO5: Know how to prepare and use working papers, such as checklists





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: III

Semester: V

### CORE COURSE – X AUDITING

Subject code: 22CMBECA1

#### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

#### III BCOM CA

PO \ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	2
CO3	3	2	3	2	3
CO4	3	3	2	3	3
CO5	3	2	3	2	2
Optimum Point	3	2	3	2	2

  
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## **ALLIED COURSE – III INTRODUCTION TO ORACLE AND SQL (with Practical)**

**Subject code:22CCCA9**

### **UNIT-I:**

Introduction to File – Flat File – Advantage and disadvantage of Flat File – Introduction to Database - Types of database structure: Hierarchical Data Base – Relational Data Base – Object Relational Data Base.

### **UNIT-II:**

Introduction to Relational Database – Relational Database terms: Records – Fields – Tables – Advantage and disadvantage of Relational Database.

### **UNIT-III:**

Keys: Primary Key – Foreign Key – Candidate Key – Composite Key - Super Key – Implementation of those keys on tables.

### **UNIT-IV:**

Introduction to Oracle: Creating database – Creating tables – Setting Primary Key and Foreign Keys on tables – Introduction to SQL queries: CREATE, ALTER, DROP, RENAME, TRUNCATE, SELECT statements – Retrieving data – Restricting and Sorting data.

### **UNIT-V:**

Function – Single Row Function – Group Function – Reporting Aggregated data – Displaying data from multiple tables – Sub Queries.

### **COURSE OUTCOME:**

CO1: Understand the basic concepts of relational databases ensure refined code by developers

CO2: To Create reports of sorted and restricted data

CO3: To identify the major structural components of the Oracle Database

CO4: Students to create report of aggregated data.

CO5: To create and reading Sequences, Synonyms, Indexes





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: III

### CORE COURSE – INTRODUCTION TO ORACLE AND SQL (with Practical)

**Subject code:22CCCA9**

#### MAPPING

CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put

II BCOM CA

PO \ CO	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	2	2	3	2	3
<b>CO2</b>	3	2	-	2	2
<b>CO3</b>	2	3	2	-	2
<b>CO4</b>	2	2	2	2	2
<b>CO5</b>	2	3	2	-	2
<b>Optimum Point</b>	2	2	1	1	2

  
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## PG & RESEARCH DEPARTMENT OF COMMERCE

### B.COM COMMERCE

#### PROGRAMME OUTCOME

**The Objectives of B.COM Programme are:**

- PO1:** Becoming knowledgeable in the field of commerce and apply the conceptual interpersonal managerial skills for decision making in a business enterprise.
- PO2:** Gain analytical skill in the areas of accounting, finance, taxation and related commerce courses.
- PO3:** Understand and appreciate professional ethics, community living and nation building initiatives.
- PO4:** Exhibit professional skill and knowledge for pursuing CA, CMA, ACS, and other career-oriented programmes like ACCA, CFA, MBA and related PG build competency to manage business and leadership challenges.
- PO5:** Capability of the students to make decisions at personal & professional level will increase after completion of this course.



## **CORE COURSE – IV – BUSINESS ACCOUNTING**

**Subject code: 22CCCM3**

### **UNIT – I**

Branch accounts (excluding foreign branches) – Departmental accounts

### **UNIT – II**

Hire Purchase accounts – Royalty accounts.

### **UNIT – III**

Admission and Retirement of a partner, Death of a partner.

### **UNIT – IV**

Dissolution of firm – piecemeal distribution.

### **UNIT – V**

Insurance claims for loss of stock and profits – insolvency accounts – statement of affairs – insolvency of individual only.

#### **COURSE OUTCOME:**

CO1: Updates students with working knowledge of business accounting and branch accounting.

CO2: Imparts conceptual knowledge of various accounting concepts of hire purchase accounts and instalment purchase system

CO3: To know about the self-balancing and sectional balancing ledgers and royalty account

CO4: acquaints learners with knowledge about the fire insurance claim for loss of stock and profit and accounting for sale or return

CO5: Create the knowledge about the insolvency accounts and prepare the statement of affairs.







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Tiruchirappalli - 620 003

## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: I

Semester: II

Subject Code: 22CCCM3

CORE COURSE I – BUSINESS ACCOUNTING

### MAPPING

#### CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

#### I BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	2	3
CO4	2	3	2	3	2
CO5	2	3	3	3	3
Optimum Point	2	3	2	3	3



## **Core Course I – BANKING THEORY LAW AND PRACTICE**

### **Subject code: 22CCCM8**

#### **UNIT I :**

Relationship of banker and customer – Definition of the term banker and customer – General relationship – special relationship – main functions and subsidiary services rendered by banker – agency services and general utility services – safe custody deposit – letters of credit – issue and payment of demand drafts and foreign bills, merchant banking.

#### **Unit II:**

Operations of Bank Accounts – fixed deposits – Fixed deposit receipts and its implications, savings deposit accounts – current Accounts – recurring deposit Accounts – new deposit savings schemes – introduced by banks – super savings package – cash certificate, annuity deposit – reinvestment plans – perennial premium plan – Non resident (external) accounts scheme.

#### **Unit III:**

Types of Customers, account holders – procedure and proactive for opening and conducting and closing of accounts of customers particulars of individuals including minor, illiterate persons – married women – lunatics – drunkards – joint stock companies – Non trading associations – registered and registered clubs – societies, customers' attorney – executive and administration – charitable institutions – trustees – liquidators – receivers – local authorities – steps to be taken on death, lunacy, bankruptcy – winding up in case of Garnishee orders.

#### **Unit IV:**

Paying and collecting bankers – rights responsibilities and duties of paying and collecting banker- precautions to be taken in paying and collecting of cheques – protection provided to them nature of protection and conditions to get protection – meaning of terms – such as payment in due course – recovery of money paid at mistake.

#### **Unit V:**

Pass book and Issue of duplicate pass book – cheques - Definition of a cheque – requisites of a cheque – drawing of a cheque - types of cheque – alteration – marking – crossing – different forms of crossing and their significance – loss of cheques in transit – legal effect.

### **COURSE OUTCOME:**

CO1: Creates understanding the concepts of banking and special relationship between banker and customer.

CO2: To create the knowledge about operation of Bank Accounts, deposits, savings accounts, current accounts etc.,

CO3: To make them understand about types of customers and procedure for opening and closing of accounts.

CO4: Create the knowledge about paying and collecting bankers, rights, responsibility and duties of paying and collecting banker.

CO5: Examine the pass book and issue of duplicate pass book, cheque and drawing a cheque.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: I

Semester: II

**Subject Code: 22CCCM8**

**CORE COURSE I – BANKING THEORY LAW AND PRACTICE  
MAPPING**

### CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-“

### II BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	2	3	3	2	3
CO4	3	3	3	2	3
CO5	3	3	3	2	3
Optimum Point	3	3	3	2	3



## **CORE COURSE I – COST ACCOUNTING**

**Subject code: 22CCCM7**

### Unit – I

Definition, Scope and nature of cost accounting – cost concepts – classification – objectives and advantages – demerits of cost accounting – methods and techniques – cost unit – cost centres – cost sheet.

### Unit – II

Materials cost – purchase procedure – stores procedure – receipt and issue of materials – storage organization and layout – Inventory control – levels of stock, perpetual inventory. ABC Analysis, EOQ – Stores ledger – pricing of material issues, FIFO, LIFO, Simple Average & Weighted Average.

### Unit – III

Labour cost – Time recording and time booking – methods of remuneration and incentive schemes – overtime and idle time – labour turnover - types – causes and remedies.

### Unit – IV

Overheads – collection, classification, allocation, apportionment, absorption – recovery rates – Over & Under absorption – cost sheet and cost reconciliation statement.

### Unit – V

Job costing, Contract costing, Process costing (Normal loss, Abnormal loss and gains only) – operating costing

### **COURSE OUTCOME:**

CO1: Enable the students to understand critical concepts related to cost sheet

CO2: Provide the students necessary knowledge to compute inventory control and stocks using different methods

CO3: To give an exposure on computation of wage rates

CO4: To provide critical understanding on time rate and piece rate systems

CO5: To offer the students necessary knowledge on over heads and related allocations





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PG & RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: IV

Subject Code: 22CCCM7

CORE COURSE I – COST ACCOUNTING

## MAPPING

### CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put

## II BCOM

PO/CO	PO1	PO2	PO3	PO4	PO5
CO-1	3	3	3	2	2
CO-2	3	3	2	3	2
CO-3	3	3	2	3	2
CO-4	2	3	3	-	2
CO-5	2	3	3	2	3
Optimum Point	2	3	2	2	2



## **Core Course III – BUSINESS TOOLS FOR DECISION MAKING**

**Subject code: 22CCCM4**

### **Unit I:**

Introduction – tabulation and classification – diagrams and graphs, measure of central Tendency  
- arithmetic mean, Median, Mode, Geometric Mean – harmonic mean.

### **Unit II:**

Measures of Dispersion – range – quartiles – deciles – percentiles – quartile deviation  
mean deviation – standard deviation – co-efficient of variation.

### **Unit III:**

Measurement of Skewness Karl person & Bowley methods – correlation – simple rank – co-efficient of concurrent  
deviation.

### **Unit IV:**

Regression analysis – simple regression – equations – x on y – Y on X – Time series analysis –Components – fitting  
a straight line by method of least square – moving average.

### **Unit V:**

Index numbers – weighted and unweighted – price Index numbers – types – tests in index numbers – time and factor  
reversol test - cost of living index number – aggregate method  
family budget method.

## **COURSE OUTCOME:**

CO1: To understand the basic knowledge about statistics, analyze statistical data using measures of central tendency.

CO2: To analyze statistical data using measures of dispersion.

CO3: Demonstrate and interpret the correlation between two variables, calculate the regression analysis.

CO4: To know about the analysis of time series, components, moving average.

CO5: Acquire knowledge on vital statistics, index numbers and calculate an indices from given data.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: IV

### BUSINESS TOOLS FOR DECISION MAKING

Subject code: 22CCCCM4

#### MAPPING

#### CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put

#### II BCOM

PO/CO	PO1	PO2	PO3	PO4	
CO1	3	3	3	3	3
CO2	3	3	2	2	2
CO3	2	3	3	2	3
CO4	3	2	3	3	3
CO5	2	2	3	2	2
<b>Optimum Point</b>	3	2	3	2	2



## **ALLIED COURSE – V – COMPANY LAW**

**Subject code: 22CSACCM2**

### **UNIT – I**

Company – Definition – kinds – Incorporation – duties of Secretary regarding registration memorandum of association – Ultravires – alteration of memorandum.

### **UNIT – II**

Types of secretaries – Functions – Company Secretary's appointment – Legal position – rights and liabilities – qualities and qualifications.

### **UNIT – III**

Articles of association – contents – Alteration – Doctrine of Constructive notice – Indoor management – prospectus.

### **UNIT – IV**

Shares – kinds – redemption of preference shares – premium and discount – allotment – irregular allotment – minimum subscription – forfeiture of shares – secretarial duties regarding the above– share warrants, stocks.

### **UNIT – V**

Membership of companies – Transfer and Transmission of shares – Blank transfer – forged transfer – management of companies – Board of directors – managing director – meetings of companies – Notice, Proxy, minutes, resolution etc., legal provisions.

### **COURSE OUTCOME:**

CO1: Provides basic knowledge regarding formation of Joint Stock Company and incorporation

CO2: To understand the memorandum of association, contents, articles of association.

CO3: Students will learn about share capital, kinds of shares, voting rights etc.,

CO4: To know about the statutory meeting, annual general meeting and resolutions.

CO5: Students will able to understand the winding up of a company, modes of winding up.







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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: IV

### ALLIED COURSE – V – COMPANY LAW

Subject code: 22CSACCM2

#### MAPPING

#### CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put

#### II BCOM

PO/CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	2	2
-CO3	3	3	2	3	1
-CO4	3	3	3	3	-
CO5	2	-	3	3	2
<b>Optimum point</b>	3	2	2	3	2

## **CORE COURSE – XI – FINANCIAL MANAGEMENT**

**Subject Code: 16CCCCM12**

### **UNIT I:**

Financial Management: Meaning and scope – objectives – functions – approaches - types financial decisions – time value of money – cost of capital – cost of debt – cost of equity – cost of retained earnings – weighted average cost of capital.

### **UNIT II:**

Financial planning – meaning and scope – capital structure – Net income approach – net operating income approach – MM approach – arbitrage process – traditional approach – capital structure planning.

### **UNIT III:**

Leverage – meaning and types – significance – operating leverages, financial leverage – combined leverage – Dividend policy – Determinants of dividend policy, types of dividend – theories – bonus issue – stock splits.

### **UNIT IV:**

Working capital management – determinants of working capital – forecasting of working capital requirements. Cash management – cash budget – concentration banking and lock box system

### **UNIT V:**

Receivable management – objectives – factors influencing size of receivables – credit policies – Incremental analysis. Inventory management – meaning – objectives – techniques – purpose of holding inventory – levels of stock – EOQ – inventory turnover ratio – ABC analysis – VED analysis.\

### **COURSE OUTCOME:**

CO1: To understanding the concept of financial management, Scope, functions and objectives of financial management and to prepare the financial statement.

CO2: Imparts knowledge to the learner about how to prepare the capital structure such as EBIT, EPS and theories of capital structure.

CO3: Familiarizes the students to understand the leverage, determination of dividend policy of companies.

CO4: Provides practical knowledge about the financial decision such as working capital management and stages of cash management

CO5: Creates understanding of the concept of receivable management and company's credit policy and know about the inventory management.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: III

Semester: VI

### ALLIED COURSE – V – FINANCIAL MANAGEMENT

Subject code: 16CCCM12

#### MAPPING

#### CO - PO – PSO matrices of course

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put

#### III BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	1
CO4	3	3	2	3	3
CO5	2	2	3	3	3
<b>Optimum Point</b>	3	3	2	3	2



## **CORE COURSE – XIV INCOME TAX THEORY LAW & PRACTICE**

**Subject Code: 16CCCM13**

### Unit- I

Basic concepts – Definition - previous year –assessment year – person, assesses, income, total income, casual income, capital and revenue - residential status and incidence of tax, incomes exempt under section 10.

### Unit- II

Salary – Basis of charge – different forms of salary, allowances, perquisites and their valuation – deduction from salary –Computation of taxable salary.

### Unit- III

House property – basis of charge – determination of annual value - GAV, NAV – income from let-out property – self occupied property – deductions-Computation of taxable income.

### Unit- IV

Profits and gains of business and profession – basis of charge – methods of accounting – deductions – dis allowances, Computation of taxable income.

### Unit – V

Capital gains – basis of charge – short- and long-term capital gains – indexed cost of acquisition and improvement – exemptions – chargeability of short- and long-term capital gains – computation of taxable capital gains. Income from other sources – interest on securities, etc. deduction under Sec 80C – Introduction to direct taxes code.

### **COURSE OUTCOME:**

CO1: Introduce the concepts related to income tax

CO2: To Understand the different forms of incomes for individuals

CO3: To create an idea about income which are generated from house property

CO4: To make the students aware of assessment made for individuals

CO5: To Empowers the Practical exposure on income tax provisions.





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**PG & RESEARCH DEPARTMENT OF COMMERCE**

**Year: III**

**Semester: VI**

**CORE COURSE – XIV INCOME TAX THEORY LAW & PRACTICE**

Subject code: **16CCCCM13-CO**

**MAPPING**

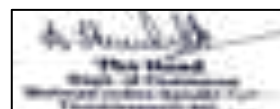
**CO - PO – PSO matrices of course**

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put

**III BCOM**

<b>PO/CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
CO1	3	3	3	3	3
CO2	3	2	2	2	3
CO3	3	3	2	3	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
<b>Optimum Point</b>	3	3	2	3	3





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Truchitappalli - 570 002

## **PG & RESEARCH DEPARTMENT OF COMMERCE**

### **B.COM COMMERCE**

#### **PROGRAMME OUTCOME**

**PO1:** Becoming knowledgeable in the field of commerce and apply the conceptual inter personal managerial skills for decision making in a business enterprise.

**PO2:** Gain analytical skill in the areas of accounting, finance, taxation and related commerce courses.

**PO3:** Understand and appreciate professional ethics, community living and nation building initiatives.

**PO4:** Exhibit professional skill and knowledge for pursuing CA, CMA, ACS, and other career-oriented programmes like ACCA, CFA, MBA and related PG build competency to manage business and leadership challenges.

**PO5:** Capability of the students to make decisions at personal & professional level will increase after completion of this course.

  
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Truchitappalli-570 002

## **PRINCIPLES OF ACCOUNTANCY**

**Subject Code: 22CCCM1**

### **Unit I:**

Introduction–Accounting concepts and conventions–Accounting Standards–Meaning -Double entry system– Journal, Ledger, Subsidiary books, Trial Balance –Bank Reconciliation Statement.

### **Unit II:**

Final Accounts of sole traders with adjustment entries-Rectification of Errors.

### **Unit III:**

**Accounts** of Non-profit organization–Bills of exchange–Average due date– Account Current.

### **Unit IV:**

Consignments and Joint Ventures.

### **Unit V:**

**Single Entry System. Depreciation-Methods, provisions and reserves**

### **COURSEOUTCOME:**

CO1:To create the knowledge of various accounting concepts, conventions and policies of accounting

CO2: Familiarizes the students to working knowledge of Accounting Standards and about the rules and regulations of accounting.

CO3: Guides the students towards understanding the Accounting concepts and knowledge about the accounting

CO4: To understand the techniques of consignment and joint-venture and final accounts of consignment.

CO5: To acquaint learner with knowledge regarding accounting procedures related fire insurance claims and the process of claims



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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year:I

Semester: I

Subject Code: 22CCCM1

### CORECOURSEI- PRINCIPLES OF ACCOUNTANCY MAPPING

#### CO -PO -PSO matrices of course

1:Slight (Low)2:Moderate(Medium)3:Substantial(High) If

there is no correlation, put “-“

#### I BCOM

PO/CO	PO 1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2
CO2	3	3	2	2	2
CO3	3	3	2	3	3
CO4	2	3	3	2	2
CO5	2	1	3	1	2
Optimum Point	3	3	2	2	2





# MARKETING

Subject code: 22CCCCM2

## Unit I:

Definition and meaning of marketing –Modern concept of Marketing –Marketing and selling – Marketing functions – buying transportation – warehousing – standardization – Grading – Packaging

## Unit II:

Buyer's behavior –Buying motive–Market segmentation–Marketing strategic– product development -,introduction of new product –branding–packaging brand loyalty– product life cycle.

## Unit III:

Pricing methods and strategic –physical Distribution–wholesaler and retailer – Services rendered by them.

## Unit IV:

Promotional Methods–Advertising–Publicity–Personal selling–Sales Promotion

## Unit V:

Marketing Research– importance in marketing decisions–Interactive marketing– Use of Internet – Online auction – Recent.

## COURSE OUTCOME:

**CO1:** To understand the fundamentals of marketing, modern concept of marketing and role of marketing

**CO2:** Equip the student to learn about the buyer's behaviour and know about the product planning and development.

**CO3:** To know about the pricing, strategies of pricing and channel of distribution.

**CO4:** To understanding the construction of effective advertisement, highlights the role of advertising for the success of brand and its importance.

**CO5:** To create the knowledge about marketing information system and techniques of marketing research.





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Tiruchirappalli - 620 002

## PG & RESEARCH DEPARTMENT OF COMMERCE

Year:I

Semester: I

### Subject Code: 22CCCM2 CORECOURSEI-MARKETING

#### MAPPING

#### CO -PO –PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

If there is no correlation, put

#### I BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2
CO2	3	-	2	1	2
CO3	3	2	2	2	2
CO4	3	2	2	2	2
CO5	2	-	2	2	2
Optimum Point	3	1	2	2	2



**CORECOURSE I –MANAGEMENT CONCEPT**  
**Subject Code: 22 CFACCM1**

**UNIT I**

Management - Meaning – Art or Science – Management and Administration Functions – Contributions by F.W. Taylor – Henry Fayal

**Unit II**

Planning – Nature, Characteristics – Steps in Planning – type of planning – components MBO

**Unit III**

Organization– principles of organization structure–organization charts –departmentation- authority – responsibility – delegation of authority – centralization and decentralization – line and staff organization – committee form of organization.

**Unit IV**

Motivation – Significance - Theories of Motivation (Maslow's and McGregor's) Communication process – Types – Barriers – Elective Communication – Leadership – Significance – Styles of leadership.

**Unit V**

Co-ordination:Co-ordination Vs Control Steps in Control process–significance–Essentials of Effective Control System

**COURSEOUTCOME:**

**CO1:**Creates understanding of the concept of management along with evolution of management, functions and levels of management.

**CO2:**To understand the planning and process of planning, methods and advantages of planning.

**CO3:**Providesthestudents'knowledge about the organization and structure, departmentation and authority and responsibility.

**CO4:**To create the knowledge about the motivation, motivation process and theories of motivation.

**CO5:**Develop the students for leadership style, co-ordination and control techniques.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year :II

Semester: III

Subject Code: 22 CFACCM1

### CORECOURSEI –MANAGEMENT CONCEPT MAPPING

#### CO -PO –PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

If there is no correlation, put

#### I BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	2
CO2	3	1	2	1	3
CO3	3	2	3	2	2
CO4	3	3	3	2	3
CO5	2	3	1	3	2
Optimum Point	3	2	2	2	2



**Course cores BUSINESSLAWS**

**Subject code: 22CCCCM6**

**UNIT- I**

Introduction – Definition and scope of mercantile law – growth and sources of mercantile law – Nature and kinds of contracts – offer and acceptance – consideration – capacity of parties– freeconsent–legalityofobjectandofconsideration,VoidAgreements–contingent contracts

**UNIT- II**

Performance of contracts–Discharge of contracts–remedies for breach including specific performance – Quasi contracts.

**UNIT- III**

Indemnity and Guarantee–Bailment and pledge–Agency.

**UNIT- IV**

Laws of sale of Goods

**UNIT- V**

Law of Negotiable Instruments.

**COURSE OUTCOME:**

**CO1:** Provides a brief idea about the mercantile law, nature and kinds of contract and acceptance.

**CO2:** To understand the performance of contracts and discharge of contracts

**CO3:**To Provides the knowledge towards indemnity and guarantee ,bailment and pledge.

**CO4:**To Know about the law of sale of Goods ,sale and agreement to sell ,conditions and warranty.

**CO5:** To know about negotiable instruments understand then votes, bills ,cheques and promissory note





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## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: III

Subject Code: 22CCCM6  
CORECOURSEI–BUSINESS LAWS

### MAPPING

#### CO -PO –PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

If there is no correlation, put

#### II BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3
CO2	2	3	3	2	3
CO3	2	3	3	2	3
CO4	3	3	2	2	3
CO5	3	2	3	3	3
Optimum Point	3	3	3	2	3



## **ALLIED COURSE– IV–BUSINESS COMMUNICATION**

**Subject code: 22CSACCM1**

### **UNIT– I**

Nature and scope of Business English – meaning, need and importance of Commercial correspondence–effective business letters–layout–Kinds of Business letters–language of a business letter – commercial terms and abbreviations.

### **UNIT– II**

Letters of Enquiry–replies, and quotations–orders–execution–cancellation.

### **UNIT– III**

Claims, complaints and adjustments–circular letters–status enquiries–collection letters.

### **UNIT– IV**

Letters relating to Agency – Application for jobs – bank Correspondence relating to exports and imports..

### **UNIT– V**

Drafting of Business reports – Press reports – market reports – speech writing..

### **COURSEOUTCOME:**

**CO1:** The learners will understand the basic communication aspects such as kinds of business letter, layout etc.

**CO2:** Create the knowledge about the enquiry and reply letter.

**CO3:** able to analyse the collection letter, sales letter and circular letter, claims and adjustment.

**CO4:** Understand the basics of application letter and give guidelines to write application letters and resumes.

**CO5:** To create knowledge about modern communication such as online communication, Fax, E-Mail, Voice mail SMS, Internet, Tele-Conferencing, etc.,





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Tiruchirappalli - 620 003

## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: II

Semester: III

### CORECOURSEI–BUSINESS COMMUNICATION

Subject code: 22CSACCM1

#### MAPPING

#### CO -PO –PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

If there is no correlation, put

#### II BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2
CO2	2	2	2	2	3
CO3	3	2	2	2	3
CO4	2	3	2	2	3
CO5	3	3	2	3	3
Optimum Point	2	2	2	2	3





## **CORE COURSE– VII– CORPORATE ACCOUNTING**

**Subject Code: 16CCCM9**

### **UNIT– I**

Company accounts–introduction–legal provisions regarding issues of shares, applications, allotment, calls, forfeiture, re-issue, premium and discount–accounting entries.

### **UNIT– II**

Issue and redemption of debentures and preference shares

### **UNIT– III**

Amalgamation, Absorption, nature of purchase – nature of merger, external and internal reconstruction of companies.

### **UNIT– IV**

Holding companies account – Consolidation of balance sheet (excluding inter company Owings, cross holdings, chain holding).

### **UNIT– V**

Final Accounts Of Banking Companies (new format) and Insurance companies ( new format).

### **COURSE OUTCOME:**

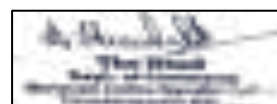
CO1: Students will gain the knowledge of accounting for issue of shares, forfeiture and re-issue of shares, issue of bonus shares.

CO2: Students will learn the concept of redemption of preference shares, issue and redemption of debentures and accounting procedure of redemption.

CO3: To know about the term amalgamation and methods of accounting for amalgamation and accounting entries for purchasing and vendor companies.

CO4: Students will be able to know accounting for holding company and legal requirements relating presentation of accounts.

CO5: It help the students in obtaining a greater understanding final accounts of banking companies and insurance company.





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Tiruchirappalli - 620 002

## PG & RESEARCH DEPARTMENT OF COMMERCE

Year: III

Semester: V

### CORE COURSE– VII– CORPORATE ACCOUNTING

Subject Code: 16CCCM9  
MAPPING

#### CO -PO –PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

If there is no correlation, put

#### III BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO5	2	2	2	3	3
Optimum Point	3	3	2	3	3



## **CORE COURSE– VIII–AUDITING**

**Subject code: 16CCCCM10**

### **UNIT– I**

Introduction–definition of audit –objects of audit –classification of audit –internal audit – periodical audit – continuous audit – interim audit – balance sheet audit – internal check – internal control – procedure of audit – audit programme – test check.

### **UNIT– II**

Vouching of cash transactions, trading transactions personal and impersonal ledgers – valuation and verification of assets and liabilities.

### **UNIT– III**

Depreciation - Meaning – Causes – Methods – Auditors duties regarding depreciation– Reserves – Classification of reserves – Secret reserves – Auditors duties regarding secret reserves.

### **UNIT– IV**

Audit of limited companies – share capital audit – share transfer audit – appointment, qualification rights and liabilities of company auditors – audit reports.

### **UNIT– V**

Divisible profits and Dividends–Investigations–Audit of computerized Accounting.

### **COURSEOUTCOME:**

**CO1:** To create the knowledge auditing, interim audit, balance sheet audit and internal check.

**CO2:** Creates understanding of the vouching such as cash and trading transaction, personal and impersonal.

**CO3:** To know about the verifications and valuation of assets and liabilities and enables create knowledge about auditor's duty and reserves.

**CO4:** To know about appointment, qualification, rights and liabilities of company auditors and audit report.

**CO5:** Creates understanding for the need and benefits of having audit of financial statements and audit of computerized accounting.





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## PG & RESEARCH DEPARTMENT OF COMMERCE

### AUDITING

Subject Code: 16CCCM10

Year: III

Semester: V

### MAPPING

#### CO -PO –PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

If there is no correlation, put

#### III BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	2
CO3	3	2	3	2	3
CO4	3	3	2	3	3
CO5	3	2	3	2	2
Optimum Point	3	2	3	2	2



## **CORECOURSE– IX–COMPUTER APPLICATIONS TO BUSINESS**

**Subject Code: 16CCCCM11**

### **UNIT– I**

Computer – Operating System – Ms Word – Creating word documents – creating business letters using wizards – editing word documents –inserting objects – formatting documents – spelling and grammar check – word count – thesaurus, auto correct working with tables – savings, opening and closing documents – mail merge.

### **UNIT– II**

Introduction to spread sheets – spread sheet programmes and applications – Ms Excel and features – Building work sheets – entering data in work sheets, editing and formatting work sheets – creating and formatting different types of charts -application of financial and statistical function – creating, analyzing and organizing data using – Automatic total saving, opening and closing work books. Introduction to Pivot tables.

### **UNIT– III**

Fundamentals of Computerized accounting – Computerized accounting Vs manual accounting - Architecture and customization of tally – Features of tally 7.2, 9.1 versus – Configurationoftally– Tallyscreensandmenus–Creation of company–Creating of groups – Editing and deleting groups – Creation of ledgers – Editing and deleting ledgers – Introduction to vouchers – Vouchers entry – Payment vouchers – Receipt vouchers – Sales vouchers – Purchase vouchers – Contravouchers – Journalvouchers – Editing and deleting vouchers.

### **UNIT– IV**

Introduction to Inventories – Creation of stock categories – Creation of Stock groups – Creation of Stock items- Configuration and features of stock item – Editing and deleting stocks– Usage of stocks in Vouchers entry. Purchase orders –Stock vouchers– Sales orders –Stock vouchers–Introduction to cost –creation of cost category– Creation cost centers– Editing and deleting cost centers & categories –Usage of cost category and cost –centers in vouchers entry–Budget and controls– Creation of budgets–Editing and deleting budgets– Generating and printing reports in detailed and condensed format.

### **UNIT– V**

Day books – Balance sheets – Trial balance – Profit and Loss account – Ratio analysis, Cash flow statement – Fund flow statement – Cost center report – Inventory report - Bank reconciliation statement.

**COURSEOUTCOME:**

**CO1:** To demonstrate a basic understanding of computer hardware and software and to create the knowledge basic understanding of network principles.

**CO2:** Students will be able to prepare the mark statement and work in MS-Excel.

**CO3:** To know about the fundamentals of Computerized accounting and Architecture and customization of Tally.

**CO4:** To understand and demonstrate the inventories and configuration and features of stock items, stock categories, unit of measurement etc.

**CO5:** Prepare the financial statement, cash/funds flow statement and cost centre





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## PG & RESEARCH DEPARTMENT OF COMMERCE COMPUTER APPLICATIONS TO BUSINESS

Subject Code: 16CCCCM11

Year: III

Semester: V

### MAPPING

#### CO -PO –PSO matrices of course

1:Slight(Low)2:Moderate(Medium)3:Substantial(High)

If there is no correlation, put

#### III BCOM

PO/ CO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
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CO4	3	3	3	3	3
-CO5	2	3	2	3	3
Optimum Point	3	3	2	3	3



