BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI – 620 024.

B.Sc. Chemistry Course Structure under CBCS

(For the candidates admitted from the academic year 2016-2017 onwards)

Updated on 07.03.2019

Semester	Part	Course	Title	Inst. Hours/ Week	Credit	Exam Hours	Marks		Total
							Int	Ext	
I	I	Language Course–I (LC) – Tamil*/Other Languages ** #		6	3	3	25	75	100
	II	English Language Course - I (ELC)		6	3	3	25	75	100
	III	Core Course – I (CC)	General Chemistry I	6	6	3	25	75	100
		Core Practical – I (CP)	Volumetric Analysis (P)	3	-	-	-	-	-
		First Allied Course–I (AC)	Mathematics I / Botany I / Computer Science / Zoology I	4	4	3	25	75	100
		First Allied Course – II (AP)	Mathematics II / Botany / Computer Science / Zoology	3	-	-	-	-	-
	IV	Value Education	Value Education	2	2	3	25	75	100
	Total			**30**	**18**				**500**
II	I	Language Course–II (LC)– Tamil*/Other Languages ** #		6	3	3	25	75	100
	II	English Language Course–II (ELC)		6	3	3	25	75	100
	III	Core Course – II (CC)	General Chemistry – II	6	6	3	25	75	100
		Core Practical – I (CP)	Volumetric Analysis (P)	3	3	3	40	60	100
		First Allied Course – II (AP)	Mathematics II / Botany / Computer Science / Zoology	3	3	3	25 40	75 60	100
		First Allied Course – III (AC)	Mathematics III / Botany II / Computer Science / Zoology II	4	2	3	25	75	100
	IV	Environmental Studies	Environmental Studies	2	2	3	25	75	100
	Total			**30**	**22**				**700**
III	I	Language Course – III (LC)– Tamil*/Other Languages ** #		6	3	3	25	75	100
	II	English Language Course-III (ELC)		6	3	3	25	75	100
	III	Core Course – III (CC)	General Chemistry - III	6	6	3	25	75	100
		Core Practical – II (CP)	Semimicro Analysis	3	-	-	-	-	-
		Second Allied Course – I (AC)	Physics I	4	4	3	25	75	100
		Second Allied Course-II/ (AP)	Physics (P)	3	-	-	-	-	-
	IV	Non Major Elective I-for those who studied Tamil under Part-I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil upto +2 but opt for other languages in degree programme	Chemistry in Every Day Life	2	2	3	25	75	100
	Total			**30**	**18**				**500**

IV	I	Language Course –IV (LC) - Tamil*/Other Languages ** #		6	3	3	25	75	100
	II	English Language Course – IV (ELC)		6	3	3	25	75	100
	III	Core Course – IV (CC)	General Chemistry - IV	5	5	3	25	75	100
		Core Practical – II (CP)	Semi Micro Analysis (P)	3	3	3	40	60	100
		Second Allied Course-II (AP)	Physics (P)	3	3	3	40	60	100
		Second Allied Course - III	Physics II	3	2	3	25	75	100
	IV	Non Major Elective II-for those who studied Tamil under Part I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil upto +2 but opt for other languages in degree programme	Health Chemistry	2	2	3	25	75	100
		Skill Based Elective - I	Skill Based Elective - I	2	2	3	25	75	100
			Total	**30**	**23**				**800**
V	III	Core Course – V (CC)	Inorganic Chemistry - I	5	5	3	25	75	100
		Core Course – VI (CC)	Organic Chemistry - I	5	5	3	25	75	100
		Core Course – VII (CC)	Physical Chemistry - I	**6**	**5**	3	25	75	100
		Core Practical – III (CP)	Physical Chemistry (P)	3	3	3	40	60	100
		Major Based Elective – I	Analytical Chemistry / Material & Nano Chemistry	**5**	**5**	3	25	75	100
	IV	Skill Based Elective - II	Skill Based Elective - II	2	2	3	25	75	100
		Skill Based Elective – III	Skill Based Elective - III	2	2	3	25	75	100
		Soft Skills Development	Soft Skills Development	2	2	3	25	75	100
			Total	**30**	**29**				**800**
VI	III	Core Course – VIII (CC)	Organic Chemistry - II	6	6	3	25	75	100
		Core Course – IX (CC)	Physical Chemistry - II	6	6	3	25	75	100
		Core Practical – IV (CP)	Gravimetric & Organic Analysis (P)	6	5	6	40	60	100
		Major Based Elective II	Nuclear, Industrial Chemistry & Metallic State	6	6	3	25	75	100
		Major Based Elective III	Polymer Chemistry / Pharmaceutical Chemistry	5	5	3	25	75	100
	V	Extension Activities	Extension Activities	-	1	-	-	-	-
		Gender Studies	Gender Studies	1	1	3	25	75	100
		Total		**30**	**30**				**600**
Grand Total				**180**	**140**				**3900**

Language Part – I	-	4
English Part –II	-	4
Core Paper	-	9
Core Practical	-	4
Allied Paper	-	4
Allied Practical	-	2
Non-Major Elective	-	2

Skill Based Elective	-	3
Major Based Elective	-	3
Environmental Studies	-	1
Value Education	-	1
Soft Skill Development	-	1
Gender Studies	-	1
Extension Activities	-	1 (Credit only)

* for those who studied Tamil upto 10th +2 (Regular Stream)

+ Syllabus for other Languages should be on par with Tamil at degree level

those who studied Tamil upto 10th +2 but opt for other languages in degree level under Part I should study special Tamil in Part IV

** Extension Activities shall be out side instruction hours

Non Major Elective I & II – for those who studied Tamil under Part I

a) Basic Tamil I & II for other language students
b) Special Tamil I & II for those who studied Tamil upto 10th or +2 but opt for other languages in degree programme

Note:

	Internal Marks	External Marks
1. Theory	25	75
2. Practical	40	60

3. Separate passing minimum is prescribed for Internal and External marks

FOR THEORY

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]
The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks]

FOR PRACTICAL

The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks]
The passing minimum for University Examinations shall be 40% out of 60 marks [i.e. 24 marks]

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SEMESTER VI MAJOR BASED ELECTIVE II

Hours/Week: 6
Credits: 6

NUCLEAR, INDUSTRIAL CHEMISTRY & METALLIC STATE

OBJECTIVES

1. To know the fundamentals of nuclear chemistry.
2. To understand the applications of nuclear chemistry.
3. To study the metallic bond, theories and applications.
4. To understand the applications of inorganic polymers.

UNIT I NUCLEAR CHEMISTRY I

1.1 Introduction, nuclear structure – composition of the nucleus, subatomic particles, nuclear forces, nuclear stability – mass defect and binding energy, whole number rule and packing fraction, n-p ratio, odd even rules, nuclear models – liquid drop and shell models, isobars, isotones and isomers.

1.2 Isotopes – detection, physical and chemical methods of separation,isotopic constitution of elements.

1.3 Radioactivity – introduction – radioactive emanations – characteristics of α, β and γ-rays, disintegration theory, modes of decay-group displacement law, rate of integration and half-life period, disintegration series, Geiger-Nuttal rule.

UNIT II NUCLEAR CHEMISTRY II

2.1 Detection and measurement of radioactivity – Wilson cloud chamber, Geiger – Muller counter.

2.2 Particle accelerators – linear accelerator and cyclotron.

2.3 Artificial radioactivity – nuclear transformation – classification of nuclear reactions, fission – atom bomb, fusion – hydrogen bomb, Stellar energy – nuclear reactor – atomic power projects in India.

2.4 Applications of radioisotopes as tracers in reaction mechanism, medicine, agriculture, industry and carbon dating. Hazards of radiations.

UNIT III METALLIC STATE

3.1 Metallic bond : Packing of atoms in metals (BCC, CCP, HCP) electron gas, Pauling and band theories, structure of alloys, substitutional and interstitial solid solutions, Hume-Rothery ratios, crystal defects – stoichiometric and non- stoichiometric defects.

3.2 Semi conductors - intrinsic and extrinsic – n-type and p-type. Composition, properties, structure and uses in electronic industry.

UNIT IV INORGANIC POLYMERS AND THERMO ANALYTICAL METHODS

4.1 Inorganic polymers – coordination polymers, metal alkyls, phosphonitrilic polymers.
4.2 Silicates – classification into discrete anions – one, two and three dimensional structures with typical examples.
4.3 Composition, properties and uses of beryl, asbestos, talc, mica, feldspar and zeolite.

UNIT V INDUSTRIAL CHEMISTRY

5.1 Gaseous fuels : Natural gas, gobar gas, water gas, semi water gas, carburetted water gas, producer gas and liquified petroleum gas (LPG) – composition, manufacture and applications.
5.2 Fertilizers : Manufacture of nitrogen, phosphorus, potassium and mixed fertilizers, micro nutrients and their role in plant life.
5.3 Safety matches : Introduction, raw materials and manufacturing method.
5.4 Paints and varnishes : Definition, types and composition.
5.5 Glass : Composition, manufacture, types and uses.
5.6 Cement : Manufacture – wet and dry processes, composition and setting of cement.

BOOKS FOR REFERENCE:

1. R.D. Madan, "Modern Inorganic Chemistry", 2nd edition, S. Chand & Company Ltd., 2000.
2. Gilreath, 'Fundamental concepts of Inorganic Chemistry', 18th Printing, McGraw Hill International Book Company, 1985.
3. S. Glasstone, 'Source book on Atomic Energy', East-West Press, 1967.
4. R.Gopalan, P.S. Subramanian and K. Rengarajan, 'Elements of Analytical Chemsitry', Sultan Chand & Sons, 2nd edition, 1991.
5. P.L.Soni, 'Text Book of Inorganic Chemistry', 20th revised edition, Sultan Chand & Sons, 2000.

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