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**BHARATHIAR UNIVERSITY, COIMBATORE -641 046**  
**B.Sc. CHEMISTRY - SCHEME OF EXAMINATIONS (CBCS PATTERN)**  
**(For the students admitted from the academic year 2016-2017 and onwards)**

Part	Study Components	Course Title	Ins. hrs/week	Exam			Credits
				CIA	Unic xam	Total	
<b>Semester I</b>							
I	Language-I		6	25	75	100	4
II	English-I		6	25	75	100	4
III	Core I – Chemistry Paper I		7	25	75	100	4
III	Core Chemistry Practical – I		3	-	-	-	-
III	Allied A - Paper I* (or) Paper I **		6	25	75	100	4
			4	20	55	75	3
III	Allied Practical**		2	-	-	-	-
IV	Environmental Studies #		2	-	50	50	2
<b>Semester II</b>							
I	Language-II		6	25	75	100	4
II	English-II		6	25	75	100	4
III	Core II– Chemistry Paper II		7	25	75	100	4
III	Core III– Chemistry Practical I (Inorganic Quality Analysis)		3	40	60	100	4
III	Allied A - Paper II* (or) Paper II **		6	25	75	100	4
			4	20	55	75	3
III	Allied Practical**		2	20	30	50	2
IV	Value Education - Human Rights #		2	-	50	50	2
<b>Semester III</b>							
I	Language-III		6	25	75	100	4
II	English-III		6	25	75	100	4
III	Core IV – Chemistry Paper III		3	25	75	100	4
III	Core V – Chemistry Paper IV		3	25	75	100	4
III	Core Practical II		2	-	-	-	-
III	Allied B - Paper I* (or) Paper I**		6	25	75	100	4
			4	20	55	75	3
III	Allied Practical**		2	-	-	-	-
IV	Skill Based Subject Chemistry of natural and synthetic fibers		2	20	55	75	3
IV	Tamil @/Advanced Tamil # (Or) Non-Major Elective - I (yoga/women's rights #)		2	-	50	50	2
<b>Semester IV</b>							
I	Language-IV		6	25	75	100	4
II	English-IV		6	25	75	100	4
III	Core VI – Chemistry Paper V		4	25	75	100	4
III	Core VII– Chemistry Practical II (Volumetric and Organic Analysis)		3	40	60	100	4
III	Allied B - Paper II* (or) Paper II**		6	25	75	100	4
			4	20	55	75	3
III	Allied Practical**		2	20	30	50	2

Part	Study Components	Course Title	Ins. hrs/week	Exam			Credits
				CIA	Univ. Exam	Total	
IV	Skill based Subject	Technology of Dyeing of Natural Fibres	3	20	55	75	3
IV	Tamil @/Advanced Tamil # (OR)	Non-major elective -II (General Awareness #)	2	-	50	50	2
<b>Semester V</b>							
III	Core VIII – Chemistry Paper VI		5	25	75	100	4
III	Core IX – Chemistry Paper VII		5	25	75	100	4
III	Core X – Chemistry Paper VIII		5	25	75	100	4
III	Core XI – Chemistry Paper IX		4	25	75	100	4
III	Core - Chemistry Practical III		4	-	-	-	-
III	Elective –I From Group I		4	25	75	100	4
IV	Skill based Subject	Water & Effluent Treatment And Pollution Control	3	20	55	75	3
<b>Semester VI</b>							
III	Core XII – Chemistry Paper X		5	25	75	100	4
III	Core XIII - Chemistry Paper XI		5	25	75	100	4
III	Core XIV - Chemistry Practical III	Gravimetric And Physical	7	40	60	100	4
III	Elective –II From Group II		4	20	55	75	3
III	Elective –III From Group III		4	20	55	75	3
III	Core XV– Practical for Elective subjects		3	40	60	100	4
IV	Skill based Subject	Textile Chemistry Practical	2	30	45	75	3
V	Extension Activities @		-	-	-	50	2
Total						3500	140

\* For subjects without practical \*\* For subjects with Practical

@ No University Examinations. Only Continuous Internal Assessment (CIA)

# No Continuous Internal Assessment (CIA). Only University Examinations.

**List of elective papers (colleges can choose any one of the papers as electives)**

Elective I	Elective II	Elective III
(A) polymer chemistry	(A) Leather chemistry	(A)Analytical chemistry II Lab Techniques
(B) Agro industrial chemistry	(B)Chemistry of plant based products	(B)Environmental chemistry
(C) Pharmaceutical chemistry	(C)Dye chemistry	(C)Textile chemistry

**ALLIED SUBJECTS**

1. Mathematics, 2. Physics, 3. Botany, 4. Zoology & 5. Biochemistry

**Note : The syllabus for the following papers furnished below be followed and there is no change in the syllabi of remaining papers.**

## **CORE VI - CHEMISTRY PAPER V**

Teaching hours : 60 Hours per semester (4 hours per week)

### **Subject description**

This paper presents the chemistry of few metals, phenols, amines and phase rule.

### **Goals**

To enable the students to learn about the reactions of phenol and amines .

### **Objectives**

To study the reaction of phenol and amines and applications of phase rule.

### **Contents**

#### **UNIT I :**

Occurrence, extraction, properties and uses of Zirconium, Vanadium, Molybdenum and Tungsten -their important compounds  $V_2O_5$ ,  $ZrOCl_2$ , ammonium molybdate, molybdenum blue,  $WO_2$ , and tungsten bronzes.

#### **UNIT II :**

Monohydric phenols - preparation & properties –Reaction of monohydric phenols with mechanism – alkylation, esterification, nitration, sulphonation, halogenation coupling with diazonium salts – Kolbe, Reimer – Tiemann, Schotten – Bauman and Gattermann reactions.

#### **UNIT III :**

Amines- Preparation and properties of aliphatic and aromatic primary, secondary and tertiary amines – their separation, comparison of their basicity – ring substitution, diazotization and coupling reaction of aromatic amines.

Diazomethane and diazoacetic ester – preparation, structure and their synthetic applications.

#### **UNIT IV :**

**Phase rule and phase equilibria –the equilibrium condition. Stability of phase of a pure substance. Pressure dependence of  $\mu$  and T curves. The Clapeyron and Clausius equations. Derivation of Gibbs phase rule. Phase equilibria in one component system. Phase diagram for sulphur, water, carbondioxide system, phase diagram for two component system – construction of the phase diagram/Thermal analysis method Bi-Cd; Zn-Mg and Na-K system.**

#### **UNIT V :**

Solutions: ideal and non ideal – Raoult's law, Henry's law – Nernst distribution law and its applications.

Colligative properties- relative lowering of vapour pressure, elevation of boiling point, depression of freezing point and osmotic pressure- their applications.

## CORE X - CHEMISTRY PAPER VIII

Teaching hour : 60 hours per semester (4 hours per week)

### Subject description

This paper presents about phase rule, phase equilibria and the principles of conduction Electro motive force, and fuel cells.

**Goals** To enable the students to know about electro chemistry. **Objectives** To study EMF, pH and their applications.

### Contents

#### UNIT I :

Electrical conduction, conduction in metals and in electrolytic solutions. Measurement of conductivity in electrolytic solutions. Migration of ions-Kohlrausch's law. Arrhenius theory of electrolytic dissociation-Ostwald's dilution law. Theory of strong electrolytes-Debye-Huckel-Onsagar theory (elementary account only ) verification. Debye-Falkenhagen effect-Wien effect-Transport numbers-Determination. Conductometric titrations.

#### UNIT II:

**Ionic Equilibria -Solubility and solubility product-determination of solubility product-Applications of solubility product principle. Dissociation of weak acids and bases-Dissociation constants-pH scale-common ion effect-buffer solutions- Determination of pH values of buffer mixtures-Henderson's equation-Hydrolysis of salts-Degree of hydrolysis.**

#### UNIT III:

Electrochemical cells. Electrode potentials-The standard hydrogen electrode kinds of electrodes and their potentials-Nernst equation. EMF-computation and measurement of cell EMF. Single electrode potential-Determination and significance of electrode potentials- electro chemical series- temperature dependence of the cell EMF- Thermodynamic quantities of cell reactions.

#### UNIT IV:

Reference electrodes-Electrodes for measurement of pH-concentration cells with and without transport-liquid junction potential-applications of EMF measurements. Redox potential-Redox indicators-uses. Potentiometric titrations.

#### UNIT V:

Fuel cells: Hydrogen- oxygen cell and hydrocarbon - oxygen cell. Storage cells. Lead storage cell and Nickel cadmium cell. Decomposition voltage-over voltage-Deposition and discharge potential.