BHARATHIAR UNIVERSITY,COIMBATORE -641 046

B.Sc. CHEMISTRY - SCHEME OF EXAMINATIONS (CBCS PATTERN)

(For the students admitted during the academic year 2014-2015 and onwards)

Part	Study Components	Course Title	Ins. hrs / week	Exam			Credits
				CIA	Uni. exam	Total	
	Semester I						
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)		6	25	75	100	4
	Paper I **		4	20	55	75	3
III	Allied Practical**		2	-	-	-	-
IV	Environmental Studies #		2	-	50	50	2
	Semester II						
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	Chemistry Practical I (Inorganic Quality Analysis)		3	40	60	100	4
III	Allied A - Paper II* (or)		6	25	75	100	4
	Paper II **		4	20	55	75	3
III	Allied Practical**		2	20	30	50	2
IV	Value Education - Human Rights #		2	-	50	50	2
	Semester III						
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)		6	25	75	100	4
	Paper I**		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
	Semester IV						
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)		6	25	75	100	4
	Paper II**		4	20	55	75	3
III	Allied Practical**		2	20	30	50	2
IV	Skill based Subject		3	20	55	75	3

Part	Study Components	Course Title	Ins. hrs / week	Exam			Credits
				CIA	Uni. exam	Total	
	Technology of Dyeing of Natural Fibres						
IV	Tamil @/Advanced Tamil # **(OR)** Non-major elective -II (General Awareness #)		2	-	50	50	2
	Semester V						
III	Core VIII – Chemistry Paper VI		4	25	75	100	4
III	Core IX – Chemistry Paper VII		4	25	75	100	4
III	Core X – Chemistry Paper VIII		4	25	75	100	4
III	Core XI – Chemistry Paper IX		4	25	75	100	4
III	Core - Chemistry Practical III		7	-	-	-	-
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
	Semester VI						
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 Analysis and Chemistry 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)

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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 above papers (**except Core V – Chemistry Paper IV, Chemistry Practical III and Practical for Elective subjects**) be the same as prescribed for the academic year 2010-11.

The syllabus for the **Core V – Chemistry Paper IV, Chemistry Practical III and Practical for Elective subjects** are furnished below.

CORE V – CHEMISTRY PAPER IV

Teaching hours: 45 hours per semester (3 hours per week)

Subject description

This paper presents the basic aspects of thermodynamics, adsorption, chromatography and computer programming.

Goals

To enable the students to understand the laws of thermodynamics, adsorption and the Computer C Programming.

Objectives

To study the applications of computer programming in chemistry and the importance of send and thermodynamics, adsorption and chromatography**.**

UNIT I:

Introduction to second law of thermodynamics – Carnot cycle – entropy – Definition – Entropy changes in isothermal transformation –Trouton's rule. Entropy as function of T and V – Entropy as a function of T and P – Changes of entropy with T, Entropy changes in ideal gas – entropy of mixing of ideal gases.

UNIT II

General conditions of equilibrium and spontaneity- conditions of equilibrium and spontaneity under constants – definition of A and G – physical significance of – dA and dG.

Temperature and pressure dependence of G – Gibbs – Helmholtz equation. Chemical equilibrium – The concept of chemical potential – chemical potential in a mixture of ideal gases – van't Hoff Isotherm and isochore – Third law of thermodynamics – statement and applications. Exception to third law.

UNIT III ADSORPTION AND CATALYSIS

Adsorption – types, differences between chemisorption and physisorption – Adsorption of Gases by solids – Adsorption isotherms – Freundlich, Langmuir isotherms derivations – BET EQUATION (Derivation not required) – Adsorption from solutions – ion exchange adsorption Types and applications – Techniques to determine the adsorped molecules on solid surfaces.

Catalysis – classification – differences between Homogeneous and Heterogeneous catalysis – Acid Base catalysis – Kinetics and Mechanisms – Autocatalysis – Enzyme catalysis Characteristics and mechanism - Michaelis – Menton equation.

UNIT IV

CHROMATOGRAPHY

Chromatographic methods – Partition Adsorption – Basic principles – Differential migration, adsorption phenomenon, nature of adsorbents, choise of solvents and Rf value – Techniques and applications of Paper, Column and TLC – Gas chromatography and HPLC (Basic principles only).

UNIT V Some important C programs for Chemistry

Programs: To calculate pH of solution and find that it is basic, acidic or neutral. Calculation of pH of a solution using Henderson equation.To compute the order of a reaction.To compute the

half-life period of a reaction. To compute the rate constant of a 1st order Reaction.To compute the energy of activation of a reaction.

REFERENCES:

1 .Principles of physical chemistry, B.P.Puri, L.R.Sharma and M.S.Phathania, Shobanlal Nagin Chand & Co.
2. Physical chemistry G,W.Castelan, Narosa publishers.
3. Physical chemistry(volll) – N.B.Singh, ShivasaranDas,A.K.Singh –New Age International Publishers – First edition(2009)
4. Introduction to Chromatography – V.K.Srivatsava and K.K.Srivatsava – S.Chand& Company – Second edition(1981)
5. Computer for chemists – By PundirBansal – PragatiPrakasam Pubs

CORE XIV - CHEMISTRY PRACTICAL III
GRAVIMETRIC ANALYSIS AND CHEMISTRY PHYSICAL
V & VI TH SEMESTERS

I. GRAVIMETRIC ANALYSIS :

1. Estimation of Sulphate as Barium Sulphate.
2. Estimation of Barium as Barium Chromate.
3. Estimation of Lead as Lead Chromate.
4. Estimation of Calcium as Calcium Oxalate.
5. Estimation of Nickel as Nickel Dimethyl glyoximate.

II. PHYSICAL CHEMISTRY EXPERIMENTS :

1. Determination of rate constant of acid-catalysed hydrolysis of an ester (Methyl acetate or Ethyl acetate).
2. Determination of K_f / molecular weight by Rast's macro method-Naphthalene, Diphenyl and diphenylamine.4. Determination of critical solution temperature of Phenol-Water system.
3. Determination of concentration of an electrolyte (NaCl/KCl/succinic acid).
4. Phase Diagram – Simple Eutectic system.
5. Determination of cell constant, specific conductivity and equivalent conductivity of strong electrolyte.
6. Determination of dissociation constant of a weak acid (acetic acid).
7. Conductometric titrations, strong-acid-strong base.
8. Conductometric titrations, strong-acid-weak base.

CORE XV - PRACTICAL FOR ELECTIVE SUSBJECTS V AND VITH SEMESTERS (3hours per week)

1. Determination of Melting point/Boiling point of an organic substance.
2. Preparation of inorganic complexes.
   (a) Tetrammine copper (II) sulphate
   (b) Potassium Trioxalato chromate (III)
   (c) Hexammine Cobalt (II) chloride
   (d) Potassium Trioxalato Ferrate(III)
   (e) Sodium Cuprous Thiosulphate.
3. Preparation involving, Hydrolysis, Oxidation, Halogenation, Nitration and Benzoylation.
4. Estimation of Hardness of Water using EDTA.
5. Estimation of Magnesium by EDTA
6. Estimation of Zinc by EDTA