Sri Ramakrishna College of Arts and Science
(Autonomous)

(Formerly S.N.R. Sons College)
(Affiliated to Bharathiar University)
(Re-Accredited with 'A' Grade by NAAC)
(An ISO 9001:2008 Certified Institution)
Nava India, Coimbatore-641 006, Tamil Nadu, India.

"Scheme of Examination along with Distribution of Marks and Credits"

CBCS & OBE PATTERN

UNDER GRADUATE PROGRAMMES

BSc Degree Course

(For the students admitted during the academic year 2018 - 2019 and onwards)

Part	Study Components and Course Title	CIA	Comprehensive Exam		Comprehensive Exam Total	Total	Credit
			Online	Descriptive Theory			
Semester - I							
I	Language-I 18T01 Tamil - I / 18H01 Hindi - I / 18F01French - I / 18M01 Malayalam - I	30	-	-	70	100	3
II	18E01 English-I	30	-	-	70	100	3
III	18CH101 CORE I - General Chemistry - I	30	20	50	70	100	5
III	18CH102 CORE II - Practical - I Volumetric Analysis Practical	15	-	-	35	50	2
III	18CH103 ALLIED I - Biochemistry	30	20	50	70	100	3
III	18CH104 ALLIED II - Practical - I Biochemistry Practical	15	-	-	35	50	2
IV	18VE01Value Education #	100	-	-	-	100**	1#
IV	18CPE01PACE - I @	-	-	-	100	100**	1@
IV	18CHJC1JOC - I $	-	-	-	-	-	1$

Semester - II							
I	Language-II 18T02 Tamil -2 / 18H02 Hindi - 2 / 18F02 French - 2 / 18M02 Malayalam - 2	30	-	-	70	100	3
II	18E02 English-II	30	-	-	70	100	3
III	18CH201CORE III - General Chemistry -II	30	20	50	70	100	5
III	18CH202 CORE IV - Polymer Chemistry	30	20	50	70	100	4
III	18CH203 CORE V - Practical - II Inorganic Qualitative Analysis	30	-	-	70	100	3
III	18CH204 ALLIED III - Mathematics	30	20	50	70	100	3
IV	18ES01 Environmental Studies #	100	-	-	-	100**	1#
IV	18CPE02 PACE - II @	-	-	-	100	100**	1@
IV	18CHJC2 JOC - II $	-	-	-	-	-	1$
Semester - III							
III	18CH301 CORE VI - General Chemistry - III	30	20	50	70	100	4
III	18CH302 CORE VII - Inorganic Chemistry - I	30	20	50	70	100	4
III	18CH303 CORE VIII - Practical – III Organic Qualitative Analysis	30	-	-	70	100	3
III	18CH304 ALLIED IV - Allied Physics for Chemistry	30	20	50	70	100	3
III	18CH305 ALLIED V - Practical - II Allied Physics Practical for Chemistry	15	-	-	35	50	2
III	OPEN ELECTIVE - I	30	20	50	70	100	3
III	18CH306 Skill based Subject : 1 Introduction to Nano Chemistry	30	20	50	70	100	3
IV	18BCT01 Basic Tamil I / 18ADT01 Advanced Tamil I #	100	-	-	-	100**	1$
IV	18CPE03 PACE – III @	-	-	-	100	100**	1@
IV	18CHJC3 JOC – III $	-	-	-	-	-	1$

Semester - IV							
III	18CH401 CORE IX - Inorganic Chemistry - II	30	20	50	70	100	4
III	18CH402 CORE X - Analytical Chemistry	30	20	50	70	100	4
III	18CH403 CORE XI - Practical - IV Applied Chemistry Practical I	30	-	-	70	100	4
III	Elective – I	30	20	50	70	100	4
III	18CSC08 ALLIED VI - C Programming	30	20	50	70	100	3
III	18CSC09 ALLIED VII- C Programming Lab	15	-	-	35	50	2
III	18CH406 Skill based Subject : 2 Textile Chemistry	30	20	50	70	100	3
IV	18BCT02 Basic Tamil II / 18ADT02 Advanced Tamil II#	100	-	-	-	100**	1$
IV	18CPE04 PACE - IV @	-	-	-	100	100**	2@
IV	18CHJC4 JOC - IV $	-	-	-	-	-	1$
Semester - V							
III	18CH501 CORE XII - Organic Chemistry - I	30	20	50	70	100	5
III	18CH502 CORE XIII - Physical Chemistry - I	30	20	50	70	100	5
III	18CH503 CORE XIV – Physical Chemistry Experiments	30	-	-	70	100	3
III	18CH504 CORE XV - Gravimetric Analysis	30	-	-	70	100	3
III	OPEN ELECTIVE –II	30	20	50	70	100	3
III	18CH505 Skill based Subject : 3 Pharmaceutical Chemistry	30	20	50	70	100	3
IV	18CPE05 PACE – V @	-	-	-	100	100**	2@
IV	18CHJC5 JOC – V $	-	-	-	-	-	1$
Semester - VI							
III	18CH601 CORE XVI - Organic Chemistry - II	30	20	50	70	100	4
III	18CH602 CORE XVII - Physical Chemistry - II	30	20	50	70	100	4

III	18CH603 CORE XVIII - Spectroscopy	30	20	50	70	100	4
III	18CH604 CORE XIX - Project with viva- voce	30	-	-	70	100	4
III	Elective –II	30	20	50	70	100	4
III	18CH605 Skill based Subject : 4 Dye chemistry	30	20	50	70	100	3
V	Extension Activities NSS/NCC/SPORTS/YRC/SIS #	100	-	-	-	100**	1

$ Extra credit courses for the candidates who opted other languages in Part – I and JOC.
# No Comprehensive Examinations. Only Continuous Internal Assessment (CIA).
@ No Continuous Internal Assessment (CIA). Only Comprehensive Examinations.

** Marks will not be included in CGPA calculations.

List of Elective papers (Can choose any one of the paper as electives)		
Elective – I	A	**18CHE01** - Technology of Dyeing of Natural Fibers.
	B	**18CHE02** - Applied Chemistry
	C	**18CHE03** - Agricultural Chemistry
Elective – II	A	**18CHE04** - Chemistry for Everyday Life
	B	**18CHE05** - Industrial Chemistry
	C	**18CHE06** - Medicinal Chemistry

List of Open Elective papers offered by the dept.	
Open Elective – I	**18CHI01** - Chemistry in Changing Life Style
Open Elective – II	**18CHI02** - Food and Water Chemistry

Summary							
Part	Subject	Papers	Credit	Total credits	Papers	marks	Total marks
Part I	Languages	2	3	6	2	100	200
Part II	English	2	3	6	2	100	200
Part III	Core	19	74	92	19	1850	2400
	Allied	7	18		7	550	
	OPEN ELECTIVES	2	3	6	2	100	200
	Electives	2	4	8	2	100	200
	Skill Based	4	3	12	4	100	400
							3600
Part IV	Lang.	2	1	2$	2	100	200**
	PACE	3	1	3@	5	100	500**
		2	2	4@			
	EVS & VE	2	1	2#	2	100	200**
	JOC	5	1	5$	-	-	-
Part V	@ Extension	1	1	1	1	100	100**
	Total			140			

$ - Extra credit courses

**-NOT INCLUDED IN TOTAL MARKS

Note: Total credits may vary between140 – 145.

Syllabus Coordinator
(Dr. T. SASIKALA)

Chairman - Board of Studies
(Dr. T. SASIKALA)

18CH101 CORE – I: GENERAL CHEMISTRY – I

COURSE OBJECTIVES

- To learn the basic principles in organic and inorganic analysis.
- To know the concept of periodic table and atomic properties.
- To have an idea about the basic principles in qualitative and quantitative analysis.

Semester	I
Credit	5
Paper Type	Core
Max. Marks	CIA:30 CE :70 TOT = 100

UNIT - I NOMENCLATURE AND ISOMERISM OF ORGANIC COMPOUNS 13

Introduction, systems of naming organic compounds – Rules of IUPAC system of nomenclature for cyclic compounds, complex organic compounds – substituted alkanes, alkenes and alkynes, compounds having functional groups, polyfunctional compounds.

Isomerism: Structural Isomerism, Geometrical isomerism in alkenes, cyclic compounds- optical isomerism- conditions of optical isomerism in lactic acid, tartaric acid-properties of enantiomers, diastereoisomers, mesocompounds.

UNIT – II STRUCTURE OF ATOM 13

Discovery of electron – Measurement of e/m for Electrons. Determination of charge of an electron. – Positive rays. Protons – Nucleons – subatomic particles – Alpha particles. Rutherford's Atomic model – Mosley's determination of Atomic Number – Mass Number – Quantum Theory and Bohr Atom.

Wave mechanical concept of atom – de Broglie's equation. Heisenberg's Uncertainty principle. Schrodinger's Wave equation. Charge cloud concept and orbitals. Quantum Numbers-Principal, Azimuthal, Magnetic and Spin Quantum Numbers and their significance. Pauli's Exclusion principle. Energy distribution and orbitals. Distribution of electrons in orbitals. Representation of ground state electronic configuration of elements – Aufbau principle, n+l rule and Hund's rule.

UNIT - III PERIODIC TABLE AND ATOMIC PROPERTIES 13

Long form periodic table – cause of periodicity – division of elements into s, p, d and f block elements. Atomic properties: Sizes of atoms and ions - covalent radius, Van-derwaals radius and ionic radius. Ionization energy – factors determining ionization energy, variation of ionization energy in the periodic table. Electron affinity – variation of electron affinity in the periodic table. Electronegativity – pauling's approach, Alfred and Rochow's approach, Milliken's approach, factors influencing electronegativity, applications of electronegativity.

UNIT -IV BASIC PRINCIPLES IN QUALITATIVE ANALYSIS 14

The mole concept – atomic, molecular and molar masses. Equivalent mass – Equivalent mass of an acid, Equivalent mass of a base Equivalent mass of oxidizing and reducing agents. Concentration terms – Normality, Molarity, Molality, and Percentage solutions – weight composition, volume composition.

Principles of Volumetric analysis – Standard solution (primary and secondary standards), Titration – types (Acid, base, oxidation, reduction), equivalent point, end point, indicators – action of phenolphthalein and methyl orange, caution in volumetric titrimetry – precautions to avoid errors in titrimetric analysis, corrections for unavoidable errors.

UNIT – V QUALITATIVE ANALYSIS **13**

Basic principles and applications of analytical techniques such as precipitation, vacuum distillation, steam distillation, crystallization, fractional crystallization - Evaluation of analytical data - Accuracy and precision- methods for their expression - classification of errors - detection and correction of determinate and indeterminate errors - The normal law of distribution of indeterminate errors

COURSE OUTCOMES

- Ability to write the nomenclature of organic compounds.
- Ability to get an idea about the fundamental properties of atoms and electrons and various states of matter.
- Ability to draw electronic configurations, orbital diagrams, nomenclature of compounds and quantum number for electrons.
- Ability to create awareness about the proper laboratory safety techniques, the scientific method of collecting and analyzing information.

Total Periods: 66

TEXT BOOKS

1. B. R. Puri, L.R. Sharma and M.S. Pathania, *Principles of Physical Chemistry,* 4th ed. New Delhi: Vishal Publishing Co., 2018. (Unit-I to Unit-V)
2. Arun Bahl, B.S. Bahl and G. D. Tuli, *Essentials of Physical Chemistry*, Revised ed. New Delhi: S. Chand & Sons Publishing, 2016. (Unit-I to Unit-V).

REFERENCE BOOKS

1. B. Svehla, *Vogel's Text book of Macro and Semimicro Qualitative Analysis*, 7th ed. Newyork: Longman Inc., 1997.
2. R. D. Madan., *Modern Inorganic Chemistry*, 3rd ed. New Delhi: S. Chand & Co., 2016.
3. Sathya Praksash, G.D. Tuli, S. K. Basu, and R.D. Madan, *Advanced Inorganic Chemistry,* 19th ed. New Delhi: S. Chand & Co., 2016.
4. Dr. Wahid, U.Malik, Dr.G.D.Tuli and Dr.R.D.Madan, *Selected Topics in Inorganic chemistry*, 8th ed. New Delhi: S.Chand & Company Pvt. Ltd., 2016.

Verified by Course Coordinator
Dr.T.SASIKALA

Verified by BOS Chairman
Dr.T.SASIKALA

18CH102 CORE II PRACTICAL - I: VOLUMETRIC ANALYSIS PRACTICAL

COURSE OBJECTIVES

- To know the principles and theory of various analysis and chemical reactions.
- To acquire the skills of doing quantitative estimation by titrimetry.

Semester	I
Credit	2
Paper Type	Core Practical -I
Max. Marks	CIA:15 CE :35 TOT = 50

QUANTITATIVE ANALYSIS

a. Acidimetry and Alkalimetry:

1. Estimation of NaOH using Na_2CO_3 and decinormal HCl solution.
2. Estimation of Na_2CO_3 by HCl using a standard Na_2CO_3 Solution.

b. Permanganametry:

1. Estimation of Oxalic acid using Mohr's salt and decinormal $KMnO_4$ solution.
2. Estimation Iron (II) Sulphate by $KMnO_4$ using a standard Mohr's Salt solution.
3. Estimation of Mohr salt using Oxalic acid and decinormal $KMnO_4$ solution.

c. Dichrometry:

1. Estimation of Iron (II) by potassium dichromate using standard Mohr's salt solution.

d. Iodometry:

1. Estimation of Copper (II) Sulphate by $K_2Cr_2O_7$ solution and N/ 20 Solution of Sodium thiosulphate.

e. Complexometry:

1. Estimation of Zinc using 0.025 molar EDTA and analyze Zinc sulphate crystals.

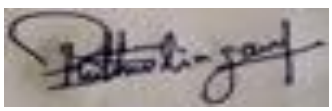
COURSE OUTCOMES

- Ability to perform simple calculations involving percentage concentrations and calculate the effect of dilution on concentrations.
- Ability to solve volumetric problems using titration, calculate relative molecular mass of a compound.
- Ability to carry out titrimetric procedures using standard solutions.
- Ability to apply knowledge of concentrations of solutions and express in estimation procedures.

Total Periods: 33

REFERENCE BOOKS

1. Venkateswaran. V, Veeraswmay. R, Kulandaivelu. A.R., *Basic Principles of Practical Chemistry*, 2nd ed. New Delhi :S.Chand and Sons, 2015.
2. Radha and Rekha, *Chemistry Laboratory Manual*, 1st ed. Chennai: Elshadai Publishers, 2011.



Verified by Course Coordinator
Dr. S. MUTHULINGAM

Verified by BOS Chairman
Dr.T.SASIKALA

18CH103 ALLIED - I: BIOCHEMISTRY

Semester	I
Credit	3
Paper Type	Allied
Max. Marks	CIA – 30 CE - 70 TOT =100

COURSE OBJECTIVES

- To enable the student to develop a sound knowledge of fundamental concepts in biochemistry.
- To enumerate the core concepts, methods and limits of scientific investigation of a living cell, structural and functional hierarchy of biomolecules.
- To provide a broad education in fundamental aspects of biochemistry and a higher level of knowledge and understanding of subject.

UNIT – I CARBOHYDRATES 10

Carbohydrates – Classification – Preparation, properties and structure of glucose and fructose –structural elucidation of glucose and fructose- muta rotation- Sucrose – Structure – Polysaccharides – Starch - structure and properties – Cellulose – Properties and derivatives.

UNIT – II AMINO ACIDS AND PROTEINS 8

Amino acids - Classification, synthesis, physical and chemical properties of amino acids. Peptides – synthesis, peptide linkage.

Proteins – Classification – Structure and colour reactions of proteins - Organization - primary (Insulin), secondary structure (alpha helix and beta structure).Enzymes - Definition and nomenclature and Classification –Isoenzymes - Enzyme inhibitors – biological applications of enzymes.

UNIT – III NUCLEIC ACIDS AND LIPIDS 10

Nucleic acids – Chemical structure and base composition of nucleic acids - nucleosides and nucleotides – purine and pyrimidine bases –DNA and RNA- Double helical structures, Watson - Crick Model.

Lipids –Definition - Classification, structure and general properties. Types and reactions of fatty acids - saturated, unsaturated oxygenated and cyclic fatty acids.- Biological role of lipids- Physical and chemical properties of fats and oils.

UNIT – IV VITAMINS AND MINERALS 11

Vitamins – Introduction, structure, properties, functions and deficiency diseases of fat soluble and water soluble vitamins. Fat soluble vitamins - A, D, E & K - Structure, Chemistry and Functions, Water soluble vitamins- B Complex (Riboflavin, Niacin, Pyridoxine, Folic acid, Cynocobalamine, Pantothenic acid) and Vitamin C (Ascorbic acid) - Clinical significance - Deficiency and Excess.

Minerals - Calcium, sodium, Phosphorus, Iodine, Fluorine, Zinc, Iron, Magnesium, Potassium - Requirements - Deficiency and Excess.

UNIT – V METABOLISM OF CARBOHYDRATES **6**

Glycolysis – salient features – reactions – Production of ATP in glycolysis. Citric acid cycle – Reaction – Role of Vitamins in TCA cycle – Inhibitors of Citric acid cycle – regulations. Gluconeogenesis – Importance- reactions – regulations – glycogen metabolism.

COURSE OUTCOMES

- Able to get an idea the basic structures and functions of cells in the human body, applying biomedical concepts and terminology.
- Able to determine the three-dimensional structure of biological macromolecules and be able to explain detailed examples of how structure enables function.
- Able to explain the classification criteria and nomenclature of the different types of simple and complex biomolecules, according to their structural characteristics.
- Able to impart an understanding of how to apply fundamental chemical principles to the study of biological systems.
- Able to schematize the molecular structure of the different types of complex biomolecules.

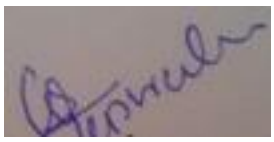
Total Periods: 45

TEXT BOOKS

1. Dr. U. Sathyanarayana, Dr. U. Chakrapani, *Fundamentals of Biochemistry*, 4th ed. New delhi: Reed Elseveir India Pvt. Ltd., 2017. (Unit-I to Unit-V)
2. Dr.J.L.Jain, Dr.Sunjay Jain and Nithin Jain, *Fundamentals of Biochemistry*, 17th ed. New Delhi: S. Chand & Company Pvt. Ltd., 2015. (Unit-I to Unit-V)

REFERENCE BOOKS

1. Lehninger, Nelson, *Principles of Biochemistry*, 4th ed. England: Cox CBS Publication, W.H. Freeman and Company, 2005.
2. Jeremy M Berg, John L Tymoczho, L. Stryer, *Biochemistry*, 5th ed. US: Library of congress Cataloguing-in-Publication data, 2003.
3. Keith Wilson and John Walker, *Principles and techniques of Biochemistry and Molecular Biology*, 6th ed. US: Library of congress Cataloguing-in-Publication data, 2006.



Verified by Course Coordinator
Ms. K.P. GREESHMA

Verified by BOS Chairman
Dr. T.SASIKALA

18CH104 ALLIED PRACTICAL - I: BIOCHEMISTRY PRACTICAL

COURSE OBJECTIVES

- To gain hands-on experience in a number of practical methods and techniques used in biological investigations.
- To develop students' understanding on the application of biochemical principles to other areas of biology and biomedical sciences.
- To develop students' awareness on the role of biochemistry both as a research discipline and its practical use in commercial and industrial applications.

Semester	I
Credit	2
Paper Type	Allied Practical- I
Max. Marks	CIA:15 CE: 35 TOT= 50

EXPERIMENTS

1. Estimation of protein by Lowry's method.
2. Characterization of protein by Biuret method.
3. Estimation of total free amino acids by Ninhydrin Method.
4. Separation of amino acids by ascending paper chromatography
5. Estimation of acid number of oil.
6. Qualitative analysis of Carbohydrates – any two.
7. Qualitative analysis of aminoacids – any two.

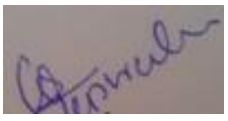
COURSE OUTCOMES

- Able to differentiate the qualitative and quantitative estimation of biomolecules (proteins, carbohydrates, lipids and enzymes) and laboratory analysis of the same in the body fluids.
- Able to devise and evaluate suitable experimental methods for the investigation of relevant areas of clinical and molecular biology.
- Able to demonstrate safe laboratory skills (including proper handling of materials and chemical waste) for particular laboratory experiments.
- Able to develop practical skills for laboratory procedures and techniques that will enable them to go for more specialists training later in their career.

Total Periods: 33

REFERENCE BOOKS

1. S. Sadasivam and A. Manickam, *Biochemical Methods*, 3rd ed. New Delhi: New Age International Publishers, 2016.
2. Keith Wilson and John Walker, *Principles and techniques of Biochemistry and Molecular Biology*, 6th ed. US:Library of congress Cataloguing-in-Publication data, 2006.



Verified by Course Coordinator
Ms. K.P. GREESHMA

Verified by BOS Chairman
Dr. T.SASIKALA

18VE01 VALUE EDUCATION

Semester	I
Credit	1
Max. Marks	CIA: 100 TOT = 100

COURSE OBJECTIVES

- To orient about the society, social life, integrity in personal and public life.
- To learn the concepts of human values and respect for others.
- To provide in-depth understanding about moral awareness.
- To inculcate a sense of socially responsible citizens.

UNIT - I VALUE EDUCATION & HUMAN EDUCATION 3

Value Education - Definition - relevance to present day - Concept of Human Values - Self Introspection - Self Esteem

UNIT – II SOCIETY & FAMILY VALUES 3

Structure and components of Society - Marriage and Family Values – Anger Neutralization , Adjustability - Threats to family life.

UNIT - III ETHICS & LEADERSHIP QUALITIES 3

Ethical values: Ethics, Social Ethics, Public Policy - Leadership qualities: Integrity, Character, Courage - Personality development – Inter-culture Tolerance.

UNIT - IV SOCIAL VALUES 3

Social Values, Faith, Service, Commitment and Decency - Fundamental Rights and Responsibilities of citizens.

UNIT–V SOCIAL PROBLEMS AND ROLE OF STUDENTS 3

Social Problems: Definition - Poverty, Illiteracy, Unemployment, Exploitation, Obscenity, Immorality - Crimes and Online Crimes - Student unrest, Ragging and Peaceful Campus - Role of Students in tackling social problems

COURSE OUTCOMES

- Develop a sense of self respect and respect for others.
- Able to occupy one's own social space and help others live peacefully.
- Develop scientific temper and logical reasoning and to apply in day to day life.

Total Periods: 15

REFERENCE BOOKS

1. Mani Jacob (Ed). 'Resource Book for Value Education', Institute for Value Education, New Delhi. 2002.
2. NCERT. "Value Education". Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
3. Daniel and Selvamony. "Value Education Today "- Madras Christian College, Tambaram and ALACHE, New Delhi, 1990.
4. Ignacimuthu S. "Values for Life". Better Yourself Books, Mumbai, 1991.
5. M.M.M.Mascaronhas. Centre for Research Education Science and Training for Family Life Promotion - Family Life Education, Bangalore, 1993.

Verified by Course Coordinator
Dr. R.THIRUMOORTHY

Verified by BOS Chairman
Dr. R.THIRUMOORTHY

18CPE01-PERSONALITY, APTITUDE AND CAREER ENHANCEMENT

(PACE – I)

Common to all the UG streams admitted from AY 2018-19

AIM:

Identifying individual student's levels of communication and employability skills through assessments. Imparting the importance of soft skills and career planning for achieving goals, intra-personal skills through motivation and perception. Developing inter-personal skills, teamwork skills and emotional intelligence. Enhancing English language vocabulary and spoken communication skills.

Semester	I
Credit	1
Paper type	Skill based
Max. Marks	Online test: 50 Viva-Voce : 50 TOT= 100

COURSE OBJECTIVES

To enable students to,

- To identify individual levels of communication and employability skills through assessments.
- To impart the importance of soft skills and career planning for achieving goals.
- To give an account of the importance of intra-personal skills through motivation and perception.
- To enhance the usage of Grammar units like Nouns, Verbs, Tenses, Simple, Compound and Complex Sentences, Active & Passive Voice, Phrases, Synonyms, Antonyms, and Homonyms.
- To enhance English vocabulary and spoken communication skills.

UNIT - I

Assessment of individual levels of communication skills, aptitude and employability skills; Psychometric test, SWOT analysis; Planning on setting goals.

UNIT - II

Introduction to Career planning; Goal setting – Introduction to Soft Skills - Presentation skills - Intra-personal skills.

UNIT - III

Emotional intelligence - Perception and Motivation.-Interpersonal Skills; Team work, styles in leadership.

UNIT - IV

Enhancement of Basic English vocabulary; Parts of Speech, Nouns, Verbs, Tenses, Simple, Compound and Complex Sentences, Active and Passive Voice, Phrases, Synonyms, Antonyms, and Homonyms Descriptive words - Combining sentences, Sentence Formation and Completion.

UNIT - V

Art of communication – the communication process - Word building and Role play; Exercise on English Language through symposiums and workshops.

COURSE OUTCOMES

On the successful completion of the PACE – I course the student would be able to…

- Identify their individual level of communication, aptitude and employability skills to understand their competency level.
- Plan their career and set their goals.
- Prove their presentation skills and also intra and interpersonal skills.
- Communicate well with improved sentence making skill and vocabulary.

Instruction Hours per Week: 40

REFERENCE BOOKS

1) A Modern Approach to Verbal and Nonverbal Reasoning by Dr. R. S. Aggarwal.
2) A Modern A Modern Approach to Verbal by Dr. R. S. Aggarwal.
3) A Modern Approach to Nonverbal Reasoning by Dr. R. S. Aggarwal.
4) A Practical Course in Spoken English by J.K.Gangal.
5) Effective English Communication for you by V.Shamala.
6) Developing Communication Skills by Krishna Mohan & Meera Banerji.
7) English for Competitive Exams by Bhatnagar.

Verified by Course Coordinator
Dr.A.Arun Rajkumar

Approved by Chairman - BOS
Dr.A.Arun Rajkumar

18CH201 CORE – III: GENERAL CHEMISTRY – II

Semester	II
Credit	5
Paper type	Core
Max. Marks	CIA: 30 CE: 70 TOT=100

COURSE OBJECTIVES

- To learn about the nomenclature of inorganic compounds and chemistry of organic compounds.
- To learn about the concept of aromaticity.
- To know about the basics of thermodynamics and thermochemistry.

UNIT-I CHEMISTRY OF ALKANES AND CYCLOALKANES 12

Structure – source of alkanes – Methods of preparation – properties - Conformation study of ethane and n-butane (Newman and Fischer projection only). Cycloalkanes - Nomenclature – methods of preparation – properties. Stability of cycloalkanes- Bayer's strain theory.

UNIT–II AROMATICITY AND NUCLEOPHILIC SUBSTITUTION REACTION 13

Aromaticity - The concept of Aromaticity, Huckel's rule (Applications not needed). Aromatic, anti-aromatic, and non-aromatic compounds,

Nucleophilic substitution reactions – S_N1, S_N2 and S_Ni reactions, neighbouring group participation. Aromatic electrophilic substitution in benzene, Arenium ion mechanism, Nitration, Sulphonation, Halogenation, Friedel – crafts alkylation and acylation.

UNIT-III THERMODYNAMICS – I 13

Basic concepts - scope and limitations - Thermodynamic terms - intensive and extensive properties - state, equilibrium - processes-nature of heat and work –- isothermal reversible and irreversible expansion works of an ideal gas - maximum work - Zeroth law of thermodynamics - Internal Energy and First law of thermodynamics - Enthalpy of a system - Relation between ΔE and ΔH-Relation between C_p and C_v – Joule Thomson effect.

UNIT - IV THERMOCHEMISTRY 13

Introduction - exothermic and endothermic reactions - Thermo chemical equations - Kirchoff's equation - types of heat of reaction - heat of formation - standard heat of formation - standard heat of reaction - heat of combustion-heat of solution - heat of neutralization-heat of fusion - heat of vaporization - heat of sublimation and heat of transition – definition - simple problems. Hess's law of constant heat summation – applications - bond energy and strength of bond - experimental determination of heat of combustion - bomb calorimeter.

UNIT – V NOMENCLATURE OF INORGANIC COMPOUNDS 15

Writing symbols of elements and formulae of inorganic species - inorganic nomenclature - names of compounds in general - names of ions – names of radicals – names of isopoly anions -names of heteropoly anions – names of acids – names of salts and salt like compounds – names of addition compounds – names of neutral hydrides – names of boron hydrides. Nomenclature of cations, anions, radicals, binary acids, oxy acids.

COURSE OUTCOMES

- Ability to write the nomenclature of organic and inorganic compounds.
- Ability to develop an idea about the basic concepts in thermodynamics.
- Ability to analyse the different types of heats of reaction.

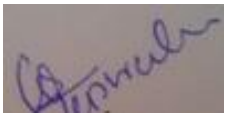
Total Periods: 66

TEXT BOOKS

1. B. R. Puri, L.R. Sharma and M.S. Pathania, *Principles of Physical Chemistry,* 4th ed. New Delhi: Vishal Publishing Co., 2018. (Unit-I)
2. Arun Bahl, B.S. Bahl and G. D. Tuli, *Essentials of Physical Chemistry*, Revised ed. New Delhi; S. Chand & Sons Publishing, 2016. (Unit-II to Unit-V)

REFERENCE BOOKS

1. R. D. Madan., *Modern Inorganic Chemistry*, 3rd ed. New Delhi: S. Chand & Co., 2016.
2. B.S. Bahl and Arun Bahl, *Advanced Organic Chemistry*, 1st ed. New Delhi: S.Chand & Company Pvt, Ltd, 2016.
3. Sathya Praksash, G.D. Tuli, S. K. Basu, and R.D. Madan, *Advanced Inorganic Chemistry,* 19th ed. New Delhi: S. Chand & Co., 2016.
4. Dr. Wahid, U.Malik, Dr.G.D.Tuli and Dr. R.D.Madan, *Selected Topics in Inorganic Chemistry*, 8th ed. New Delhi: S.Chand & Company Pvt. Ltd., 2016



Verified by Course Coordinator
Ms. K.P. GREESHMA

Verified by BOS Chairman
Dr. T.SASIKALA

18CH202 – CORE IV- POLYMER CHEMISTRY

COURSE OBJECTIVES

- To know about types of polymers and polymerization techniques
- To have knowledge about individual polymers.
- To have an idea about the recent advances in polymer science.

Semester	II
Credit	4
Paper type	core
Max. Marks	CIA: 30 CE: 70 TOT =100

UNIT-I INTRODUCTION TO POLYMERS 9

Polymers – Homo polymers – Co-polymers – Branched and cross-linked polymers, graft and block copolymers – Rubbers – Plastics – Thermoplastics – Thermosetting plastics – Fibers (Characteristic features of each) – Natural and synthetic polymers – Basic concepts of monomers – Functionality – Molecular weight – Degree of polymerization.

UNIT- II MECHANISM OF POLYMERIZATION 9

Addition polymerization – Ionic polymerization - Condensation polymerization – Copolymerization– Free radical polymerization – Ziegler Natta polymerization – Stereochemistry of polymers.

UNIT- III INDUSTRIAL POLYMERS 9

Synthesis – Properties and applications of various types of plastics and rubbers –Plastics – Polyethylene- Polyvinyl chloride – Polypropylene – Nylons – Polymethylmethacrylate, Polyethylene trephthatalate –Teflon – Polystyrene - Polycarbonates – Rubbers – Natural and synthetic rubbers – Styrene butadiene rubber – Polybutadiene – Polyisobutylene – Butyl rubber – Neoprene rubber.

UNIT-IV INTRODUCTION TO POLYMER PROCESSING 9

Compounding - Polymer Additives - Fillers, Plasticizers, antioxidants, thermal stabilizers, fire retardants and colourants - .Processing Techniques: Calendaring, die casting, compression moulding, injection moulding, blow moulding and reinforcing - Film casting - Thermoforming, Foaming.

UNIT –V ADVANCES IN POLYMERS 9

Biopolymers - biodegradable polymers - Polymers in medical field. - High temperature and fire-resistant polymers - Conducting polymers - Polymers used as adhesive and coatings - liquid crystalline polymers - Vulcanization of rubber - Polymer for engineering and biomedical applications.

COURSE OUTCOMES

- Ability to categorize the importance of industrial polymers and their classification.
- Ability to evaluate the various mechanisms and techniques of polymerization.
- Ability to develop suitable synthetic route for polymer based products and synthetic fibers.

Total Periods: 45

TEXT BOOKS

1. V.R. Gowariker, N.V. Viswanathan, N.V.Jayadev Sreedhar, *Polymer Science*, 2nd ed. New Delhi: New Age International Publishers Pvt. Ltd., 2015. (Unit-I to Unit-V)
2. B.K. Sharma, *Polymer Chemistry*, 4th ed. Meerut: Goel Publishing House, 2015. (Unit-I to Unit-V)

REFERENCE BOOKS

1. F.W. Billmeyar, *A text book of polymer science*, 3rd ed. Newyork: John Wiley & Sons, 2007.
2. M. Jenkins, *Biomedical Polymers*, University of Birmingham, U.K: Wood head publications, 2007.
3. M.G. Arora, M. Singh and M.S. Yadav, *Polymer Chemistry*, 2nd Revised ed. New Delhi: Anmol Publications Pvt. Ltd., 2003.
4. P. Bahadur and N.V. Sastry, *Principles of polymer science*, 3rd ed. New Delhi: Narosa Publishing House, 2002.

Verified by Course Coordinator
Dr. T. SASIKALA

Approved by BOS Chairman
Dr. T. SASIKALA

18CH203 CORE PRACTICAL – II: INORGANIC QUALITATIVE ANALYSIS

Semester	II
Credit	3
Paper type	Core Practical-II
Max. Marks	CIA: 30 CE: 70 TOT= 100

COURSE OBJECTIVES

- To know about the skills of using glassware's and apparatus used in qualitative analysis.
- To develop the analytical skills in inorganic qualitative analysis.
- To know the chemistry principles applied in qualitative analysis.

SEMI - MICRO QUALITATIVE ANALYSIS

Analysis of a mixture containing two cations and two anions of which one will be an interfering ion. Semi-micro methods using the conventional scheme with Hydrogen sulphide may be adopted.

CATIONS TO BE STUDIED: Lead, Copper, Bismuth, Cadmium, Iron, Aluminum, Zinc, Manganese, Cobalt, Nickel, Barium, Calcium, Strontium, Magnesium and Ammonium.

ANIONS TO BE STUDIED: Carbonate, Sulphate, Nitrate, Chloride, Bromide, Fluoride, Borate, Oxalate and Phosphate.

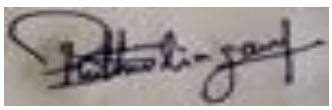
COURSE OUTCOMES

- Ability to handle glassware's and chemicals used in analysis.
- Ability to perform experiments, analyze data and interpret results and observe scientific conduct.
- Ability to identify presence or absence of number of cations or anions in solution, using tests based on acid – base and solubility.
- Ability to work effectively in diverse teams in laboratory.

Total Periods: 45

REFERENCE BOOKS

1. Venkateswaran. V, Veeraswamy. R, Kulandaivelu . A.R., *Basic Principles of Practical Chemistry*, 2nd ed. New Delhi:S.Chand and Sons, 2016.
2. G. Svehla and B. Sivasankari, *Vogel's Qualitative Inorganic Analysis*, 7th ed. New Delhi: Pearson India Education services.



Verified by Course Coordinator
Dr. S. MUTHULINGAM

Verified by BOS Chairman
Dr.T.SASIKALA
B.Sc. Chemistry (2018 Batch)

18CH204 – ALLIED II: MATHEMATICS

Semester	II
Credit	3
Paper Type	Allied
Max. Marks	CIA :30 CE :70 TOT =100

COURSE OBJECTIVES

- To learn the basic mathematical concepts.
- To familiarize the learner with applications of mathematics to chemistry.
- To know about DE and PDE and learn about the theory of equations.

UNIT – I Matrix Algebra **9**

Basic concepts – Different types of matrices – Operations on matrices – Inverse of a matrix – Rank of Matrix - Eigen values and Eigen vectors, Cayley Hamilton Theorem.

UNIT – II Differential Calculus **9**

Elementary Differential Calculus – Differentiation of Implicit Functions – Successive Differentiation – Circle – Curvature – radius and centre of curvature – co-ordinates of Centre of Curvature.

UNIT – III Integral Calculus **9**

Elementary Integral Calculus – Definite and indefinite integrals – Integration by Partial Fractions – Integration by Parts – Reduction formula for Sin^nX and Cos^nX

UNIT – IV Differential Equation **9**

Second Order linear differential equations with constant coefficients. Particular integrals of the form e^{kx}, x^k, sinkx, coskx only.

UNIT – V Differential Equation **9**

Second order linear differential equations with constant co-efficients – Particular integrals of the form X^ne^{ax} – Particular integrals of the form e^{ax}sinbx – Particular Integrals of the form e^{ax}cosbx.

COURSE OUTCOMES

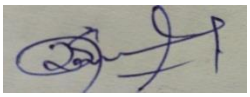
- Ability to understand the importance and applications of mathematics.
- Ability to gain knowledge about the concepts and applications and solve problems in matrices algebra.
- Ability to have knowledge about solving simple differential calculus problems.
- Ability to have knowledge about solving simple integral calculus problems.
- Ability to solve the type's differential equations and acquire knowledge about theory of equations.

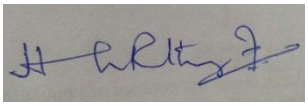
Total Periods: 45

*** Note : The Question paper consists 20% Theory and 80% Problems**

TEXT BOOKS

1. Dr. S. Arumugam and A. Thangapandi Issac, “Modern Algebra”, Scitech Publication, 2007. –(Unit I)
2. S. Narayanan and T. K. M. Pillai , “Calculus Vol. I”, Viswanathan Publishers, Reprint 2012 . - (Unit II)
3. S.Narayanan and T.K.M. Pillai , “Calculus Vol. II”, Viswanathan Publishers, Reprint 2012. - (Unit III)
4. Kandasamy. P, Thilagavathi. K “Mathematics for B.Sc – Branch – I Volume III”, S. Chand and Company Ltd, New Delhi, 2004. - Unit(IV, V)





Verified by Course Coordinator
Mrs.R.SANTHAKUMARI

Verified by BOS Chairman
Dr.F.HANNAH REVATHY

18ES01 - ENVIRONMENTAL STUDIES

Semester	II
Credit	1
Max. Marks	CIA: 100 TOT= 100

COURSE OBJECTIVES

- To recognize the major concepts of ecosystem and have in-depth understanding of environmental interactions and alternate energy resources.
- To understand the role of various environmental pollutants and its effects.
- To understand the environmental social issues and develop problem – solving skills using scientific techniques.
- To understand the Human Population growth and its variation in the environment.

UNIT-I MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES 4

Definition, scope and importance, Need for public awareness. Introduction to Renewable and Nonrenewable sources – Uses of alternate energy sources.

UNIT-II ECOSYSTEMS 6

Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Food chains, food webs and ecological pyramids. Types of ecosystem. Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Biodiversity – Levels – Patterns – Threats – Biodiversity services.

UNIT – III ENVIRONMENTAL POLLUTION 5

Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Disaster management: floods, earthquake, cyclone and landslides.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 6

Urban problems related to energy, Water conservation, rain water harvesting, and watershed management, Environmental Issues in Coimbatore District (Noyyal River, Dye Industries and Agricultural issues). Environmental ethics: Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents. Environment Protection Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation.

UNIT - V HUMAN POPULATION AND THE ENVIRONMENT 5

Population growth, variation among nations, Population explosion – Family Welfare Programme, Environment and human health, Human Rights - Women and Child Welfare, Role of Information Technology in Environment and human health.

***Activity – Visit to Local polluted site and documentation.**

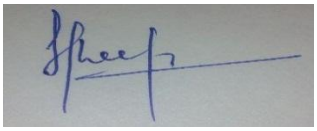
COURSE OUTCOMES

- Ability to understand the principles of ecology and major concepts in environmental sciences.
- Ability to identify the key concepts in Environmental pollution that apply to air, land and water issues on a global scale and population growth.
- Ability to relate the Socio- Environmental issues and apply them to the analysis or question related to the environment.
- Ability to understand the human rights, women and child welfare in the environment.

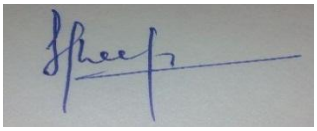
Total Periods: 26

REFERENCE BOOKS

1. Environmental Studies for Undergraduate Course – Bharathiar University.
2. Textbook for Environmental Studies for Undergraduate Courses of all Branches of Higher Education, Erach Bharucha for University Grants Commission, New Delhi and Bharati Vidyapeeth Institute of Environment Education and Research, Pune.
3. Shashi Chawla "A Text Book of Environmental Studies", 1st edition, Tata McGraw Hill, 2012.



Verified by Course Coordinator
Dr. D. JAYASHEELA



Approved by BOS Chairman
Dr. D. JAYASHEELA

18CPE02 - PERSONALITY, APTITUDE AND CAREER ENHANCEMENT (PACE – II)

Common to all the UG streams admitted from AY 2018-19

AIM:

To enrich students with the Fundamentals of English Grammar, communication skills and professional grooming. Equip them on the techniques of Group Discussion, public speaking, debate, extempore and quiz etc.

Semester	II
Credit	1
Paper Type	Skill based
Max. Marks	Online test : 50 Viva-Voce : 50 TOT = 100

COURSE OBJECTIVES

To enable students to,

- Revive the Fundamentals of English Grammar
- Improve communication skills and professional grooming.
- Learn the techniques of Group Discussion.
- Take part in public speaking, debate, extempore and quiz etc.

UNIT I

English language enhancement- Business Idioms- Indianisms in English- Common Errors in Pronunciation - Signposts in English- Verbal ability-Articles-Parts of speech-Phrases, clauses and modifiers - errors in tenses – prepositional errors – parallelism errors – mood, conditionals and multiple usages.

UNIT II

English listening- hearing Vs. listening - Nonverbal communication – Appearance, dressing and grooming -Tips to maintain good impression at work - business etiquette – basic postures and gestures and table manners, Body language - dealing with people communication - media etiquette - telephone etiquette, email etiquette.

UNIT III

Group discussion, interviews and presentation skills - Group behavior – Team Work – Team building – Open and Closed group discussions.

UNIT IV

Public speaking skills – Social Phobia – Eliminating Fear - Organizing speech and effective delivery – Common etiquette of Public speaking - opening and closing of speech, audience management and styles.

UNIT V

Exercises on Resume writing - Public speaking, Group discussion, debate, extempore, quiz and contemporary group play and role play.

COURSE OUTCOMES

- On the successful completion of the PACE - II course the student would be able to…
- Apply fundamentals of English grammar in usage, identify common errors, and pronunciation well.
- Display the art of Communication both verbally and non-verbally with business etiquette.

- Take part in in GD, Interview along with the ability of effective team work and group behavior.
- Present public speaking without fear and with fundamental social etiquettes.
- Equipped in the various exercises like GD, Debate, and Extempore and so on.

Total Hours : 40

REFERENCE BOOKS

1) A Modern Approach to Verbal and Nonverbal Reasoning by Dr. R. S. Agarwal.
2) A Modern A Modern Approach to Verbal by Dr. R. S. Agarwal.
3) A Modern Approach to Nonverbal Reasoning by Dr. R. S. Agarwal.
4) A Practical Course in Spoken English by J.K.Gangal.
5) Effective English Communication for you by V.Shamala.
6) Developing Communication Skills by Krishna Mohan & Meera Banerji.
7) English for Competitive Exams by Bhatnagar.

Verified by Course Coordinator
Dr.A.Arun Rajkumar

Approved by BOS Chairman
Dr.A.Arun Rajkumar