BACHELOR OF SCIENCE IN CHEMISTRY
CHOICE BASED CREDIT SYSTEM (CBCS) &
LEARNING OUTCOMES-BASED CURRICULAM FRAMEWORK (LOCF)
SYLLABUS & SCHEME OF EXAMINATION
2025 - 2028 BATCH - SEMESTER I

Sem	Part	Course Code	Title of the Course	Course Type	Instruction hours/week	Contact hours	Tutorial Hours	Duration of Examination	Examination Marks			Credits
									CA	ESE	TOTAL	
I	I	TAM2501/ HIN2501/ FRE2501	Tamil Paper I/ Hindi Paper I/ French Paper I	L	6	88	2	3	25	75	100	3
	II	ENG2501	English Paper I	E	6	88	2	3	25	75	100	3
	III	CE23C01	General Chemistry Paper I	CC	6	88	2	3	25	75	100	5
	III	CE23CP1	Chemistry Practical I	CC	3	45	-	-	-	-	-	-
	III	PS24A01/ TH24A18	Physics Paper I / Mathematics I	GE	4 7	58 103	2 2	3 3	20* 25	55* 75	75 100	4 5
	III	PS24AP1	Physics Practical	GE	3	45	-	-	-	-	-	-
	IV	NME25B1/ NME25A1	Basic Tamil I / Advanced Tamil I	AEC	2	28	2	-	100	-	100	2
	IV	NME23ES	Introduction to Entrepreneurship	AEC	2	30	-	-	100	-	100	
I-II	VI	NM25GAW	General Awareness	AECC	SS	-	-	-	100	-	100	Gr.
I-II	VI	COM25SER	Community Services 30 Hours	GC	-	-	-	-	-	-	-	-
I-V	VI	24BONL1 24BONL2 24BONL3	Online Course I Online Course II Online Course III	ACC	-	-	-	-	-	-	-	

L - Language
CC – Core Courses
GE – Generic Elective
AEC – Ability Enhancement Courses
AECC – Ability Enhancement Compulsory Courses
ACC – Additional Credit Courses

E - English
CA – Continuous Assessment
ESE–End Semester Examination
GC – General Courses
SS - Self Study

*CA conducted for 25 and converted to 20, ESE conducted for 75 and converted to 55

Examination System

Pattern:

Semester system will be followed. A semester consists of a minimum of 90 working days excluding the days of conduct of ESE. There will be Continuous Internal Assessment (CA) to evaluate the performance of students in each course and the End Semester Examination will be held at the end of every semester.

Weightage assigned to various components of Continuous Internal Assessment

Theory

CIA Test	: 5 marks **(conducted for 45 marks after 50 days)**
Model Exam	: 7 marks **(Conducted for 75 marks after 85 days)**
Seminar/Assignment/Quiz	: 5 marks
Class Participation	: 5 marks
Attendance	: 3 marks
Total	**: 25 Marks**

Practical

Lab Performance	: 7 marks
Regularity	: 5 marks
Model Exam	: 10 marks
Attendance	: 3 marks
Total	**: 25 marks**

CA - Question Paper Pattern and Distribution of Marks

Language and English

Section A 5 x 1 (No choice)	: 5 Marks
Section B 4 x 5 (4 out of 6)	: 20 Marks (250 words)
Section C 2 x 10 (2 out of 3)	: 20 Marks (500 words)
Total	**: 45 Marks**

Core and Allied (first 3 units)

CA Question Paper Pattern: 3 x 15 = 45 Marks

CA Question from each unit comprising of

One question with a weightage of 2 Marks :2 x 3 = 6

One question with a weightage of 5 Marks (Internal Choice at the same CLO level):5 x 3 =15

One question with a weightage of 8 Marks (Internal Choice at the same CLO level):8 x 3 =24

Advanced Tamil / Basic Tamil

CIA Test	: 25 marks **(conducted for 50 marks after 50 days)**
Model Exam	: 50 marks **(Conducted for 75 marks after 85 days)**
Quiz	: 15 marks
Assignment	: 10 marks
Total	**: 100 Marks**

Introduction to Entrepreneurship

Quiz	: 50 marks
Assignment	: 25 marks
Project / Case Study	: 25 marks
Total	**: 100 Marks**

End Semester Examination – Question Paper Pattern and Distribution of Marks

Language and English

Section A 10 x 1 (10 out of 12)	: 10 Marks
Section B 5 x 5 (5 out of 7)	: 25 Marks (250 words)
Section A 4 x 10 (4 out of 6)	: 40 Marks (600 - 700 words)
Total	**: 75 Marks**

Core and Allied

ESE Question Paper Pattern: 5 x 15 = 75 Marks

Question from each unit comprising of

One question with a weightage of 2 Marks : 2 x 5=10

One question with a weightage of 5 Marks (Internal Choice at the same CLO level): 5 x 5 =25

One question with a weightage of 8 Marks (Internal Choice at the same CLO level): 8 x 5 =40

Criteria for Attendance:

3 Marks

(Attendance 75% - 80% - 1 Mark, 81% - 90% - 2 Marks, 91% - 100% - 3 Marks)

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CE23C01	GENERAL CHEMISTRY PAPER I	THEORY	88	2	-	5

Preamble

To enable students to understand quantum mechanics as a mathematical framework for generating wave functions and energy levels, learn the fundamental concepts and physical significance of bonding theories in molecules, gain insights into polar effects and their influence on chemical properties and explore the principles of thermodynamics, thermochemistry and Industry 4.0 through physical and digital systems and their trans-formative potential in the chemical industry.

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the basics of quantum mechanics, bonding, reactive intermediates, thermodynamics and Industry 4.0	K1
CLO2	discuss the atomic structure, types of bonding, electronic effects on reactivity, stability of aromatic compounds and state/path function using thermodynamics	K2
CLO3	examine periodic properties, strength of bonding and apply principles in identifying reaction mechanism, utilize the laws of thermodynamics to understand physical processes and explore the fundamental concepts of Industry 4.0	K3
CLO4	analyze and perform calculations on periodic properties, aromaticity, bonding theories and the principles of thermodynamic and thermochemistry	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	M	S	S
CLO3	S	S	S	S	S
CLO4	S	S	M	S	S

S–Strong; M-Medium

GENERAL CHEMISTRY PAPER I (CE23C01) (88Hrs)

Unit I **(18hrs)**

Atomic Structure

Wave mechanical concepts of Rutherford's Nuclear model of the atom and its limitations. Bohr's theory and its limitations, dual behaviour of matter and radiation, de Broglie's relation, Heisenberg Uncertainty principle. Hydrogen atom spectra. Atomic orbitals. Schrodinger wave equation, Significance of ψ and $\psi 2$(no derivation required) , shapes of s, p, d orbitals. Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Quantum numbers - Electronic configuration of elements, effective nuclear charge.

Periodic Properties

Atomic and ionic radii, ionization energy, electron affinity and electronegativity–definition, factors determining ionization energy and electronegativity, and their applications.

Unit II **(18hrs)**

Chemical Bonding & Molecular Structure

Introduction to different types of Bonding- **Covalent bonding** - Valence bond theory and its limitations, Hybridisation- Types of overlap of atomic orbitals. Valence shell electron pair repulsion theory (VSEPR) to BF_3, NH_3, H_2O, CIF_3, SF_4, PF_5, SF_6.

Concept of resonance and resonating structures for CO3 and CO.

MO theory-Introduction, bonding and magnetic properties (for simple homonuclear and hetero nuclear diatomic molecules)

Ionic bonding- Factors influencing the formation of ionic bonding. Ionic crystals NaCl, CsCl. Lattice energy of ionic crystals, statement of Born-Lande equation for calculation of ionization energy, Born- Haber cycle and its application, polarizing power and polarizability. Fajan's rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character Hydrogen bonding-Types with examples. Vanderwaal's forces and London forces.

Co-ordinate covalent bond - with examples, Comparison between ionic, covalent and coordinate bonding.

Unit III **(17hrs)**

Thermodynamics-I

Definitions of terms involved, extensive and intensive properties, path functions vs state functions, exact and inexact differentials. First law of thermodynamics, adiabatic and isothermal processes, reversible and irreversible processes - Work done, Joule- Thomson effect, Joule Thomson Coefficient –Problems.

Thermochemistry

Heat of neutralization, heat of solution, heat of combustion. Bomb calorimeter, determination of heat of combustion, heat of dilution. Integral and differentials. Hess's law-calculation of bond energy, bond length, dissociation energy, Kirchoff's equation- applications.

Unit IV **(17hrs)**

Fundamental aspects of Organic reaction mechanisms

Nucleophiles and electrophiles, Reactive Intermediates: Carbocations, Carbanions and free radicals-Formation, structure and stability. Inductive Effect, Electromeric Effect, Resonance and Hyper conjugation, (Baker - Nathan effect), Steric effect-examples and effect on reactivity. Comparison of acid strength-halogen substituted acids. Basic strength of RNH_2, R_2NH, R_3N and aniline and stability of alkenes based on hyper conjugation.

Cycloalkanes-Nomenclature, methods of preparation, chemical reactions, Baeyer's strain theory and its limitations

Unit V **(18hrs)**

Aromaticity

Structure of benzene, Dewar structure, isomer number, resonance structure of benzene. Kekule structure, resonance energy and stability of benzene, reactions of benzene, orbital picture of benzene, aromatic character- Huckel's rule, non-benzenoid aromatic compounds. Aromatic electrophilic substitution-mechanism of nitration, sulphonation, halogenation, Friedel craft's alkylation, acylation and diazonium coupling

Industry 4.0

Introduction to Industry 4.0 - Need – Reasons for Adopting Industry 4.0 - Definition – Goals Technologies of Industry 4.0- Applications of Artificial Intelligence in chemistry for predicting the properties of molecular structure – Chem sketch, Chem Draw, MOPAC, Avagadro.

Text Books

S.No	Author	Title	Publishers	Year & Edition
1	Arun Bahl B.S.Bahl	Advanced Organic Chemistry	S.Chand Sons Com Pvt., Ltd.,	2016
2	Jagdamba Singh	Undergraduate Organic Chemistry Vol I	Pragathi Prakahasan	2010 3 Edn
2	P.L. Soni	Text Book of Inorganic Chemistry	Sultan Chand and Sons	2013
4	B.R. Puri, L.R. Sharma S. Patania	Principles of Physical Chemistry	Vishal Publishing & Sons	2017 47 Edn
5	P. Kaliraj, T. Devi,	Higher Education for Industry 4.0 and Transformation to Education 5.0		

Reference Books

S. No	Author	Title	Publishers	Year & Edition
1	B. R.Puri, L.R. Sharma K. Kalia	Principles of Inorganic Chemistry	Milestone Publishers and Distributors	2011 32 Edn
2	R.T. Morrison and R.N Boyd	Organic Chemistry	Pearson India Education Services	2010 6 Edn
3	R.D. Madan	Modern Inorganic Chemistry	S.Chand Sons Com Pvt., Ltd.,	2014 3 Edn
4	Alasdair Gilchrist	Industry 4.0: The Industrial Internet of Things, Apress Publications		

Related Online References

1. Introduction to Industry 4.0 and Industrial Internet of Things by Prof. Sudip Mishra, IIT Kharagpur.
2. A Complete Guide to Industry 4.0 - Udemy

Pedagogy

Lecture by chalk and talk, power point presentation, e-content, Numerical exercise, group discussion, assignment, quiz, peer learning, seminar

Course Designers

1. Dr. N. Shyamala Devi
2. Dr. S. Jone Kirubavathy

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CE24A01	CHEMISTRY FOR BIOLOGISTS - I (Offered to B.Sc Botany/Zoology)	THEORY	58	2	-	4

Preamble

To enable the students to gain knowledge about the nature of bonding and hybridization, learn the importance of aromaticity and isomerism, understand the preparation of standard solutions and chromatographic techniques, acquire knowledge on the significance of amino acids and proteins, familiarize the applications of solar energy and water treatment techniques.

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	recall the types of bonding, organic reagents, amino acids and the terms involved in analytical/environmental chemistry	K1
CLO2	understand the concept of hybridization, classify aromatic/non-aromatic compounds, amino acids/proteins and demonstrate preparation of standard solutions	K2
CLO3	interpret the structure & stereoisomerism of organic compounds and illustrate the importance of chromatographic techniques/renewable sources and water treatment technologies	K3
CLO4	appraise the theories of bonding, conformational analysis, experimental methods in analytical techniques, softening process, and its applications.	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S-Strong

Chemistry for Biologists - I (CE24A01) (58 hrs)
(Offered to B.Sc. Botany / Zoology)

UNIT I (12hrs)

Bonding

Types of bonding – Covalent bond – nature, structure and hybridization of CH_4, C_2H_4, C_2H_2 and C_6H_6 molecule.

Ionic bond – Nature of ionic bond, structure of NaCl and CsCl. Hydrogen bonding – inter and intra molecular, nature and its effect on its structure and its consequences.

Shapes and hybridization of $BeCl_2$, H_2O, NH_3 and PCl_5 based on VSEPR theory.

UNIT II (12 hrs)

Organic reactions and Stereoisomerism

Types of organic reagents - electrophiles, nucleophiles and free radicals.

Aromaticity - Huckel's rule, mechanism of nitration, sulphonation, halogenation, Friedelcraft's alkylation and acylation of benzene.

Stereoisomerism - geometrical isomerism (cis - trans isomerism only), optical isomerism (lactic acid and tartaric acid). Conformation - a simple treatment of ethane and n-butane .

UNIT III (11hrs)

Analytical Chemistry

Role and importance of analytical chemistry -principle of volumetric analysis - calibration of glasswares, standardization - experimental requirements - concentration units (normality and molarity) – types and preparation of standard solutions (primary and secondary standards).Types of titrations - indicators for acid-base titrations. Chromatography– principle and classification- paper, column, thin layer, electrophoresis and ion-exchange chromatography and its applications.

UNIT IV (11hrs)

Aminoacids and Proteins

Amino acids -classification, preparation of amino acids by Gabriel phthalimide synthesis, Erlen Meyer azlactone synthesis. Properties of amino acids and action of heat on α, β, γ amino acids - dipeptide synthesis. Protein- classification according to composition and function, primary and secondary structures, properties and colour reactions of proteins.

UNIT V **(12hrs)**

Solar energy and Water treatment

Solar energy - renewable energy and non - renewable energy sources - solar energy - solar cells, solar heating, solar collector (flat plate collector only), applications.

Water treatment - hardness of water- temporary and permanent hardness, disadvantages of hard water. Softening methods - reverse osmosis, zeolite and demineralization process. Purification of water for domestic purpose - disinfection by chlorine, ozone and UV light.

Text Books

S. No	Author	Title	Publishers	Year & Edition
1	Dr. V.Veeraiyan	Text book of Allied Chemistry	Highmount Publishing house triplican Chennai.	2006
2	R.Gopalan, P.S. Subramani and K. Rengarajan	Elements of Analytical Chemistry	Sultan Chand & Sons Educational Publisher NewDelhi	2013
3	Arun Bahl B.S. Bahl	Advanced Organic Chemistry	S.Chand Sons Comp Pvt., Ltd.,	2009
4	P.C. Jain & Monika Jain	Engineering Chemistry	Dhanpat Rai Publishing Co. Pvt., Ltd.,	2003

Pedagogy

Lecture by chalk and talk, power point presentation, e-content, numerical exercise, group discussion, assignment, quiz, peer learning, seminar

Course Designers

1. Dr. R. Revathi
2. Dr. N. Anusuya

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CE24A03	CHEMISTRY PAPER – I (offered to B.Sc Physics)	Theory	58	2	-	4

Preamble

To enable the students to understand the concepts of organic chemistry, gain knowledge about the theories of chemical bonding, understand the different terms in phase rule and its applications and learn the concepts of chemical kinetics, photochemistry, solid state chemistry.

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	recollect the types of bonding, classify organic reactions, types and examples of solutions, terminologies in thermodynamics, and the basics on the rate of a chemical reaction	K1
CLO2	relate the electronic factors that influence organic reactions, the types of chemical bonding with its effect on structure and property, law of thermodynamics on systems, theories of chemical kinetics & photo chemistry, elements of symmetry in crystal lattice	K2
CLO3	apply the concept of hybridization to organic molecules, theories of bonding in predicting structure of a molecule, laws of thermodynamics to analyze the feasibility of reactions, concept of energy of activation on reaction rate, laws in explain the ideal behavior of solutions	K3
CLO4	analyze the nature of the organic molecule based on its hybridization, electronic effect, the conducting behavior of materials, calculate the enthalphy, bond energy, entropy of a system, construct the phase diagram of simple eutectic system and analyze the typical crystal lattices	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1	M	S	S	M	M	M
CLO2	M	S	S	M	M	M
CLO3	M	S	S	M	M	M
CLO4	M	S	S	M	M	M

S-Strong; M-Medium

Chemistry Paper –I CE24A03 (58 Hrs)
(for B.Sc Physics)

UNIT I (12 Hrs)

Basics of Organic Chemistry

Classification of organic compound- types of reagents- electrophiles, nucleophiles and free radicals, Classification of reactions - addition, substitution, elimination, condensation, polymerization and rearrangements, polar effects, inductive effect, resonance, hyper-conjugation. steric effect.

Hybridization and geometry of organic molecules - CH_4, C_2H_4, C_2H_2, C_6H_6 molecules, structure of graphite and diamond.

UNIT II (12 Hrs)

Chemical Bonding

Ionic bond- nature of ionic bond, structure of NaCl, KCl and CsCl, factors influencing the formation of ionic bond. Covalent bond-nature of covalent bond, structure and shapes of $BeCl_2$, BF_3, CH_4, PCl_5, NH_3, H_2O, IF_7 based on VSEPR theory and hybridization. Hydrogen bonding - inter and intra molecular, nature and its effect on structure and properties. Metallic bonding-semiconductors - intrinsic, extrinsic n-type and p-type semiconductors.

UNIT III (11 hrs)

Energetics

Definition of certain terms - system, surrounding, reversible and irreversible process, First law of thermodynamics, limitations of I law, need for II law - different statements of II law - carnot cycle - efficiency - carnot theorem - thermodynamic scale of temperature –Joule-Thomson effect-enthalphy - bond energy – definitions of entropy and free energy.

UNIT IV (11 Hrs)

Chemical Kinetics & Photochemistry

Chemical kinetics- order and molecularity, rate expression for I, II and III order (derivation not required), methods of determining order of a reaction.

Concept of energy of activation and Arrhenius equation, effect of temperature on reaction rate.

Catalysis - homogeneous and heterogeneous catalysis, theories of catalytic activity, catalyst used in industrial processes.

Photochemistry- comparison between thermal and photochemical reactions, Beer- Lambert's law, Grotthus-Drapper's law, Einstein's law, quantum yield. Phosphorescence, fluorescence, chemiluminescence and photosensitization - definitions with examples.

UNIT V **(12 Hrs)**

Solutions and Solid State

Solution - types and examples of solutions - liquid in liquid, Raoult's laws, deviation from ideal behavior, vapour - pressure curve for a totally miscible binary liquid systems obeying Raoult's law, partially miscible liquid system (phenol-water system)

Solid state- typical crystal lattices - unit cell, elements of symmetry, Bragg's equation, Weiss Indices, Miller indices, simple body centered and face centered lattices.

Text Books

S.No	Author	Title	Publishers	Year & Edition
1.	Dr. Veeraiyan V	Text book of Allied Chemistry	Highmount Publishing House, Chennai-14	2006
2.	B.R. Puri, L.R. Sharma, L.S. Pathania	Principles of Physical chemistry	Vishal Publishing Co, Jalandhar, New Delhi	2013
3.	Satya Prakash, G.D. Tuli, Basu, R.D. Madan	Advanced Inorganic Chemistry – Vol. I	S. Chand& Co. Ltd.	2012

Pedagogy

Lecture by chalk and talk, power point presentation, e-content, numerical exercise, group discussion, assignment, quiz, peer learning, seminar

Course Designers

1. Dr. Sowmya Ramkumar
2. Dr. S. Charulatha

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CE23CP1	**CHEMISTRY PRACTICAL -I**	PRACTICAL	**-**	**-**	**90**	**4**

Preamble

To enable the students to learn the theoretical basis of qualitative inorganic analysis involving simple and interfering radicals, analyze a mixture containing two anions (including one interfering) and two cations, and perform quantitative estimations including pH calculations.

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	identify, separate the cations into groups and report the acid and basic radicals	K4
CLO2	measure the pH of different solutions	K2
CLO3	estimate the percentage amount of chlorine, carbonates, Mg, Na in bleaching powder, hard water, detergent	K3
CLO4	Prepare different buffer solutions	K1

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S – Strong

CHEMISTRY PRACTICAL - I (CE23CP1) (90 Hrs)

1. Analysis of mixture containing two anions one of which is interfering in nature and two cations: The following cations and anions may be given

   Anions : Cl^-, CO_3^{2-}, Br^-, NO_3^-, SO_4^{2-}, F^-, BO_3^{2-}, $C_2O_4^-$, CrO_4^-, PO_4^{3-}

   Cations : Pb^{2+}, Cu^{2+}, Zn^{2+}, Mn^{2+}, Co^{2+}, Ni^{2+}, Ca^{2+}, Ba^{2+}, NH_4^+, Mg^{2+}, Cd^{2+}, Sr^{2+}

GROUP EXPERIMENTS

2. (i) Estimation of available chlorine in bleaching powder

   (ii) Estimation of hardness of water

3. pH Measurements

   (i) Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps using pH meter (Note: Use dilute solutions of soaps and shampoos)

   (ii) Preparation of buffer solutions

   a. Sodium acetate-acetic acid

   b. Ammonium chloride-Ammonium hydroxide

Text Book

Lab Manual - Prepared by Faculty, Department of Chemistry, PSGRKCW

Reference book

S.No	Authors	Title	Publishers	Year & Edition
1	V. V. Ramanujam	Inorganic semi micro qualitative analysis,	The National Publishing Co.	2012 & 1 Edn.
2	Jain P. C and Jain	Engineering Chemistry	Dhanpat Rai and Sons	2013 & 16 Edn.
3	Vogel A. I	Text Book of Practical Organic Chemistry	Prentice Hall	2011 & 5 Edn.
4	Khosla B D, Garg Gulati A	Senior Practical Physical Chemistry	R Chand & Co	2011

Pedagogy

Demonstration and individual hands-on practical's

Course Designers

1. Dr. N. Shyamala Devi
2. Dr. S. Jone Kirubavathy

COURSE CODE	COURSENAME	CATEGORY	L	T	P	CREDIT
CE23AP1	CHEMISTRYPRACTICAL FOR BIOLOGISTS (offered to B.Sc Botany/Zoology)	PRACTICAL	-	-	90	2

Preamble

To enable the students to estimate the given substance volumetrically and qualitatively analyze and identify organic compounds.

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	define the various terms in volumetric analysis	K1
CLO2	perform the volumetric analysis and estimate the quantity present.	K2, K3
CLO3	identify and analyse organic compounds	K3
CLO4	Analyze the functional groups and report the confirmatory test	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S - Strong

CHEMISTRY PRACTICAL FOR BIOLOGISTS (CE23AP1) (90hrs)
(offered to B.Sc Botany /Zoology)

1. Volumetric Analysis

i. Estimation of sodium hydroxide using standard sodium carbonate.
ii. Estimation of Carbonate, bicarbonate mixture using sodium hydroxide
iii. Estimation of hydrochloric acid using standard oxalic acid.
iv. Estimation of oxalic acid using standard sulphuric acid.
v. Estimation of ferrous sulphate using standard Mohr's salt solution.
vi. Estimation of potassium permanganate using standard oxalic acid.
vii. Estimation of hardness of water (Temporary and permanent).

2. Organic Compound Analysis

Systematic analysis of organic compounds containing one functional group and characterization by confirmatory tests and preparing suitable derivative - Phenols, Acids (mono and di), Aromatic primary amine, Amides (mono and diamide) and Glucose.

Text Book

Lab Manual- Prepared by Faculty, Department of Chemistry, PSGRKCW

S.No	Authors	Title	Publishers	Year & Edition
1	N.S.Gnanapragasam, G.Ramamurthy	Organic Chemistry Manual	S.Viswanathan Print & Publishers Pvt., Ltd.,	2011 & 3 Edn.
2	A.I. Vogel	A text book of quantitative inorganic analysis	Longman publishers	2011 & 12 Edn.

Pedagogy

Demonstration and individual hands on Practicals.

Course Designers:

1. Dr.R.Revathi
2. Dr.N.Anusuya

COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	CREDIT
CE25AP2	CHEMISTRY PRACTICAL FOR PHYSICISTS (offered to B.Sc Physics)	PRACTICAL	-	-	90	2

Preamble

To enable the students to estimate the given substance volumetrically and understand the principle of potentiometric and conductometric titrations.

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	define the various terms in volumetric analysis	K1
CLO2	perform the volumetric analysis and estimate the quantity present.	K2, K3
CLO3	Calculate the hardness of water samples	K4
CLO4	recall the various terms in conductometric and potentiometric experiments	K1

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S - Strong

CHEMISTRY PRACTICAL FOR PHYSICISTS (CE25AP2) (90hrs)

(offered for B.Sc Physics)

1. Volumetric Analysis

i. Estimation of sodium hydroxide using standard sodium carbonate.

ii. Estimation of carbonate, bicarbonate mixture using sodium hydroxide

iii. Estimation of hydrochloric acid using standard oxalic acid.

iv. Estimation of oxalic acid using standard sulphuric acid.

v. Estimation of ferrous sulphate using standard Mohr's salt solution.

vi. Estimation of potassium permanganate using standard oxalic acid.

vii. Estimation of hardness of water (temporary and permanent).

2. Conductivity Experiments

i. Determination of cell constant

ii. Determination of dissociation constant of a weak acid.

iii. Conductometric titration: Acid – base

3. Potentiometric Titration

i. Acid - base

ii. Redox titration

Text Book

Lab Manual - Prepared by Faculty, Department of Chemistry, PSGR Krishnammal College for Women, Coimbatore

Reference Books

S.No.	Authors	Title	Publishers	Year & Edition
1	V.Venkateswaran, R. Veeraswamy & A.R. Kulandaivelu	Basic Principles of Practical Chemistry	S. Chand& Co.	2012
2	B. Vishwanathan, P.S. Raghavan	Practical Physical Chemistry	Viva Books	2014

Pedagogy

Demonstration and individual hands-on Practical

Course Designers

1. Dr. Sowmya Ramkumar
2. Dr. S. Charulatha

FOUNDATION COURSE

INTRODUCTION TO ENTREPRENEURSHIP (NME23ES)

Credits: 2

TOTAL HOURS: 30 hrs **LECTURE HOURS: 30 hrs**

Unit 1 **(5 hrs)**

Nature of Entrepreneurship: (3 hrs)

Meaning –Need for Entrepreneurship –Qualities of Successful Entrepreneurs - Myths of Entrepreneurship

Activity: Assignment, Discussion (2 hrs)

Unit II **(6 hrs)**

Role of Entrepreneurs (4 hrs)

Significance of Entrepreneurship to the nation –Environmental Factors influencing Entrepreneurship – Entrepreneurial Process and Functions- Challenges faced by Entrepreneurs

Activity: Quiz / Role Play (2 hrs)

Unit III **(6 hrs)**

Formulation of Business Idea: (4 hrs)

Business Idea Generation - Entrepreneurial Imagination and Creativity – Role of Innovation – Opportunity Evaluation

Activity: Business Idea Pitch (2 hrs)

Unit IV **(6 hrs)**

Business Planning: (4 hrs)

Need for Market Study – Securing Finance from various Sources - Significance of Business plan – Components of Business plan

Activity: Schemes available for Entrepreneurs (2 hrs)

Unit V **(7 hrs)**

Project:

Interface with Successful Entrepreneurs: (4 hrs)

Business Plan Presentation: (3 hrs)

Reference Books

1. D.F. Kuratko and T.V. Rao, *Entrepreneurship - South Asian Perspective*, 2016, Cengage Learning India Pvt. Ltd. Delhi.
2. Arya Kumar, *Entrepreneurship: Creating and Leading an Entrepreneurial Organization*, 2012, Pearson Education India