

B.SC DEGREE PROGRAMME IN CHEMISTRY

Programme Outcome, Programme Specific Outcome and Course Outcome



Department of Chemistry

Cardamom Planter's Association College

Bodinayakanur – 625 513.

PROGRAMME OUTCOMES (PO)

1. Students will possess basic subject knowledge required for higher studies, professional and applied courses
2. Students will acquire basic Practical skills & Technical knowledge along with domain knowledge of different subjects in the science & humanities stream.
3. Students will develop scientific aptitude Integrate skills of analysis, critiquing, application and creativity.
4. Students will employ appropriate digital tools and techniques necessary in analysing data and creative design.
5. Students will gain competence to pursue higher learning, research and careers or will be able to opt for entrepreneurship
6. Students will interact meaningfully with others displaying leadership and coordination in executing projects.
7. Students will demonstrate responsibility as citizens committed to national development through community outreach, wellness of self and a sustainable environment.

PROGRAMME SPECIFIC OUTCOMES

- PSO1:** Students acquire in-depth knowledge of the fundamental concepts in all disciplines of chemistry.
- PSO2:** Students can disseminate the basics of chemistry and advanced topics and analytical skills in organic, inorganic and physical chemistry.
- PSO3:** Students will be able develop creativity in academics and research.
- PSO4:** Students will be able apply digital tools to collect, analyse and interpret data and present scientific findings.
- PSO5:** gain competence to pursue higher education and career opportunities in chemistry and allied fields.
- PSO6:** exhibit leadership qualities to work individually and within a team in organizing curricular, co-curricular and extracurricular activities.
- PSO7:** apply the concepts of chemistry to solve problems in the community, entrepreneurial and research pursuits.
- PSO8:** exhibit competence in educational, industrial and research pursuits that contribute towards the holistic development of self and community.

GENERAL CHEMISTRY-I

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: explain the atomic structure, wave particle duality of matter, periodic properties bonding, and properties of compounds.

CO2: classify the elements in the periodic table, types of bonds, reaction intermediates electronic effects in organic compounds, types of reagents.

CO3: apply the theories of atomic structure, bonding, to calculate energy of a spectral transition, Δx , Δp electronegativity, percentage ionic character and bond order.

CO4: evaluate the relationship existing between electronic configuration, bonding, geometry of molecules and reactions; structure reactivity and electronic effects

CO5: construct MO diagrams, predict trends in periodic properties, assess the properties of elements, and explain hybridization in molecules, nature of H – bonding and organic reaction mechanisms.

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of	3.0	3.0	3.0	3.0	3.0

Course Contribution to Pos

QUANTITATIVE INORGANIC ESTIMATION (TITRIMETRY) AND INORGANIC PREPARATIONS

Course Learning Outcomes (for Mapping with POs and PSOs)

On successful completion of the course the students should be able to

CO1: explain the basic principles involved in titrimetric analysis and inorganic preparations.

CO2: compare the methodologies of different titrimetric analysis.

CO3: calculate the concentrations of unknown solutions in different ways and develop the skill to estimate the amount of a substance present in a given solution.

CO4: assess the yield of different inorganic preparations and identify the end point of various titrations.

CO-PO Mapping (Course Articulation Matrix) CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3

Weightage	12	12	12	12	12
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

FOOD CHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO 1: learn about Food adulteration - contamination of Wheat, Rice, Milk, Butter.

CO 2: get an awareness about food poisons like natural poisons (alkaloids - nephrotoxin) pesticides, DDT, BHC, Malathion

CO 3: get an exposure on food additives, artificial sweeteners, Saccharin, Cyclamate and Aspartate in the food industries.

CO 4: acquire knowledge on beverages, soft drinks, soda, fruit juices and alcoholic beverages examples.

CO 5: study about fats and oils - Sources of oils - production of refined vegetable oils - preservation. Saturated and unsaturated fats –MUFA and PUFA

CO-PO Mapping (Course Articulation Matrix) CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

ROLE OF CHEMISTRY IN DAILY LIFE

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: learn about the chemicals used in everyday life as well as air pollution and water pollution.

CO2: get knowledge on building materials cement, ceramics, glass and plastics, polythene, PVC bakelite, polyesters,

CO3: acquire information about Food and Nutrition. Carbohydrates, Proteins, Fats Also have an awareness about Cosmetics Tooth pastes, face powder, soaps and detergents.

CO4: discuss about the fertilizers like urea, NPK fertilizers and super phosphate. Fuel classification solid, liquid and gaseous; nuclear fuel - examples and uses

CO5: have an idea about the pharmaceutical drugs analgesics and antipyretics like paracetamol and aspirin and also about pigments and dyes and its applications.

CO-PO Mapping (Course Articulation Matrix) CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

GENERAL CHEMISTRY-II

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: explain the concept of acids, bases and ionic equilibria; periodic properties of s and p block elements, preparation and properties of aliphatic and aromatic hydrocarbons

CO2: discuss the periodic properties of s and p- block elements, reactions of aliphatic and aromatic hydrocarbons and strength of acids

CO3: classify hydrocarbons, types of reactions, acids and bases, examine the properties s and p-block elements, reaction mechanisms of aliphatic and aromatic hydrocarbons

CO4: explain theories of acids, bases and indicators, buffer action and important compounds of s-block elements

CO5: assess the application of hard and soft acids indicators, buffers, compounds of s and p-block elements and hydrocarbons

CO-PO Mapping (Course Articulation Matrix) CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

QUALITATIVE ORGANIC ANALYSIS AND PREPARATION OF ORGANIC COMPOUNDS

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: observe the physical state, odour, colour and solubility of the given organic compound.

CO2: identify the presence of special elements and functional group in an unknown organic compound performing a systematic analysis.

CO3: compare mono and dicarboxylic acids, primary, secondary and tertiary amines, mono and diamides, mono and polyhydric phenols, aldehyde and ketone, reducing and non-reducing sugars and explain the reactions behind it.

CO4: exhibit a solid derivative with respect to the identified functional group.

CO-PO Mapping (Course Articulation Matrix) CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
Weightage	12	12	12	12	12
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

DAIRY CHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: understand about general composition of milk – constituents and its physical properties.

CO2: acquire knowledge about pasteurization of Milk and various types of pasteurization - Bottle, Batch and HTST Ultra High Temperature Pasteurization.

CO3: learn about Cream and Butter their composition and how to estimate fat in cream and Ghee

CO4: explain about Homogenized milk, flavoured milk, vitaminised milk and toned milk.

CO5: have an idea about how to make milk powder and its drying process - types of drying process

CO-PO Mapping (Course Articulation Matrix)

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

COSMETICS AND PERSONAL CARE PRODUCTS

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: know about the composition of various cosmetic products

CO2: understand chemical aspects and applications of hair care and dental care and skin care products.

CO3: understand chemical aspects and applications of perfumes and skin care products.

CO4: to understand the methods of beauty treatments their advantages and disadvantage

CO5: understand the hazards of cosmetic products.

CO-PO Mapping (Course Articulation Matrix) CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

GENERAL CHEMISTRY -III

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: explain the kinetic properties of gases by using mathematical concepts.

CO2: describe the physical properties of liquid and solids; identify various types of crystals with respect to its packing and apply the XRD method for crystal structure determinations.

CO3: investigate the radioactivity, nuclear energy and it's production, also the nuclear waste management.

CO4: write the nomenclature, physical & chemical properties and basic mechanisms of halo organic compounds and alcohols.

CO5: investigate the named organic reactions related to phenol; explain the preparation and properties of aromatic alcohol including thiol.

CO-PO Mapping (Course Articulation Matrix)

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

Pos

Level of Correlation between PSO's and CO's

QUALITATIVE INORGANIC ANALYSIS

On successful completion of the course the students should be able to

CO1: acquire knowledge on the systematic analysis of Mixture of salts.

CO2: identify the cations and anions in the unknown substance.

CO3: identify the cations and anions in the soil and water and to test the quality of water.

CO4: assess the role of common ion effect and solubility product

CO-PO Mapping (Course Articulation Matrix) CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
Weightage	12	12	12	12	12
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

ENTREPRENEURIAL SKILLS IN CHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

CO1: identify adulterated food items by doing simple chemical tests.

CO2: prepare cleaning products and become entrepreneurs

CO3: educate others about adulteration and motivate them to become entrepreneurs.

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
Weightage	6	6	6	6	6
Weighted percentage of Course Contribution to POs	3.0	3.0	3.0	3.0	3.0

PESTICIDE CHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO 1: teach about the pesticides and their toxicity with respect to structure and category.

CO 2: explain the preparation and property of pesticides

CO 3: investigate the pesticide residues, prevention and care

CO 4: demonstrate the extraction and analytical methods of pesticide residues

CO 5: make awareness to the public on bio-pesticides

Level of Correlation between PSO's and CO's CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to POs	3.0	3.0	3.0	3.0	3.0

GENERAL CHEMISTRY-IV

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: explain the terms and processes in thermodynamics; discuss the various laws of thermodynamics and thermo chemical calculations.

CO2: discuss the second law of thermodynamics and its application to heat engine; discuss third law and its application on heat capacity measurement.

CO3: investigate the chemistry of transition elements with respect to various periodic properties and group wise discussions.

CO4: discuss the fundamental organic chemistry of ethers, epoxides and carbonyl compounds including named organic reactions.

CO5: discuss the chemistry and named reactions related to carboxylic acids and their derivatives: discuss chemistry of active methylene compounds. Halogen substituted acid and hydroxyl acids.

CO-PO Mapping (Course Articulation Matrix) CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course	3.0	3.0	3.0	3.0	3.0

Contribution to Pos

PHYSICAL CHEMISTRY PRACTICAL – I

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

CO1: describe the principles and methodology for the practical work

CO2: explain the procedure, data and methodology for the practical work.

CO3: apply the principles of electrochemistry, kinetics for carrying out the practical work.

CO4: demonstrate laboratory skills for safe handling of the equipment and chemicals

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
Weightage	12	12	12	12	12
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: apply error analysis in the calibration and use of analytical instruments, explain theory, instrumentation and application of flame photometry and Atomic Absorption spectrometry

CO2: explain theory, instrumentation and application of UV visible and Infrared spectroscopy.

CO3: able to discuss instrumentation, theory and applications of thermal and electrochemical techniques

CO4: explain the use of chromatographic techniques in the separation and identification of mixtures

CO5: explain preparation of solutions, stoichiometric calculations

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

FORENSIC SCIENCE

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: learn about the Poisons - types and classification of poisons in the living and the dead organisms and also get information about Postmortem.

CO2: get awareness on Human bombs, possible explosives (gelatin sticks and RDX) and metal defector devices and other security measures for VVIP - composition of bullets and detecting powder burns

CO3: detect the forgery documents, different types of forged signatures

CO4: have an idea about how to tracks and trace using police dogs, foot prints identification and gain the knowledge in analyzing biological substances - blood, semen, saliva, urine and hair - DNA Finger printing for tissue identification in dismembered bodies

CO5: get the awareness on Aids - causes and prevention and also have an exposure on handling fire explodes.

CO-PO Mapping (Course Articulation Matrix) CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3

CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

ORGANIC CHEMISTRY - I

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

CO1: assign RS notations to chirals and EZ notations to olefins and explain conformations of ethane and butane.

CO2: explain preparation and properties of aromatic and aliphatic nitro compounds and amines

CO3: explain colour and constitution of dyes and food additives

CO4: discuss preparation and properties of five membered heterocycles like pyrrole, furan and thiophene

CO5: discuss preparation and properties of six membered heterocycles like pyridine, quinoline and isoquinoline

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

INORGANIC CHEMISTRY -I

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

CO1: explain isomerism, Werner's Theory and stability of chelate complexes

CO2: discuss crystal field theory, magnetic properties and spectral properties of complexes.

CO3: explain preparation and properties of metal carbonyls

CO4: give a comparative account of the characteristics of lanthanoids and actinoids

CO5: explain properties and uses of inorganic polymers of silicon, sulphur, boron and phosphorous

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

PHYSICAL CHEMISTRY -I

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

CO1: explain Gibbs and Helmholtz free energy functions, partial molar quantities and Ellinghams

CO2: apply the concepts of chemical kinetics to predict the rate of the reaction and order of the reaction, demonstrate the effect of temperature on reaction rate, and the significance of free energy and entropy of activation.

CO3: compare chemical and physical adsorption, Freundlich and Langmuir adsorption isotherms, and differentiate between homogenous and heterogeneous catalysis.

CO4: demonstrate the types and characteristics of colloids, preparation of sols and emulsions, and determine the molecular weights of macromolecules.

CO5: utilize the concepts of photochemistry in fluorescence, phosphorescence, chemiluminescence and color perception of vision.

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

INDUSTRIAL CHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

CO1: summarize the properties of fuels which include petroleum, water gas, natural gas and propellents

CO2: evaluate cosmetic products, soaps, detergents.

CO3: explain manufacture of sugar, food spoilages and food additives

CO4: explain properties of abrasives, manufacture of leather and paper

CO5: explain properties and manufacture of lubricants and cement, and intellectual property rights

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

BIOCHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: explain molecular logic of living organisms, composition of blood and blood coagulation

CO2: explain synthesis and properties of amino acids, determination of structure of peptides and proteins

CO3: explain factors influencing enzyme activity and vitamins as coenzymes

CO4: explain RNA and DNA structure and functions

CO5: explain biological significance of simple and compound lipids

Level of Correlation between PSO's and CO's CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to POs	3.0	3.0	3.0	3.0	3.0

ORGANIC CHEMISTRY - II

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: explain isolation and properties of alkaloids and terpenes

CO2: explain preparation and reactions of mono and disachharides

CO3: classify biomolecules and natural products based on their structure, properties, reactions and uses.

CO4: explain molecular rearrangements like benzidine, Hoffmann etc.,

CO5: preparation and properties of organolithium compounds

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

INORGANIC CHEMISTRY –II

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: ability to explain the importance of tracer elements on biological system.

CO2: explain the metal ion transport, Bohr effect, Na, K, Ca pump.

CO3: explain the function of Vitamin B12, Zn-Cu enzyme, ferredoxin, cluster enzymes.

CO4: classification and structure of silicates.

CO5: explain the manufacture of refractories, explosives, paints and pigments

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

PHYSICAL CHEMISTRY-II

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: construct the phase diagram for one component and two component systems, explain the properties of freezing mixture, component with congruent melting points and solid solutions.

CO2: apply the concepts of chemical equilibrium in dissociation of PCl_5 , N_2O_4 and formation of HI, NH_3 , SO_3 and decomposition of calcium carbonate. Demonstrate important principles such as Le chatelier principle, van't Hoff reaction isotherm and Clausius-Clayperon equation.

CO3: Identify an appropriate distillation method for the separation of binary liquid mixtures such as azeotropic mixtures, partially miscible mixtures and immiscible liquids.

CO4: Explain the significance of Arrhenius theory, Debye-Huckel theory, Onsager equation and Kohlrausch's law in conductance.

CO5: Construct electrochemical cell with the help of electrochemical series and calculate cell EMF. Demonstrate the applications of EMF and significance of potentiometric titrations.

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

FUNDAMENTALS OF SPECTROSCOPY

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students should be able to

CO1: explain electrical and magnetic properties of materials and microwave spectroscopy

CO2: explain theory, instrumentation and applications of Infrared and Raman spectroscopy

CO3: apply selection rules to understand spectral transitions, explain Woodward – Fieser’s rule for the calculation of wavelength maximum of conjugated dienes

CO4: explain theory, instrumentation and applications of NMR spectroscopy

CO5: explain theory, instrumentation and applications of Mass spectrometry

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

PHYSICAL CHEMISTRY PRACTICAL – II

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: Describe the principles and methodology for the practical work.

CO2: Explain the procedure, data and methodology for the practical work

CO3: Apply the principles of phase rule and electrochemistry for carrying out the practical work

CO4: Demonstrate laboratory skills for safe handling of the equipment and chemicals

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
Weightage	12	12	12	12	12
Weighted percentage of Course Contribution to PSOs	3.0	3.0	3.0	3.0	3.0

NANOSCIENCE

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: explain the general concepts and physical phenomena of relevance within the field of nanoscience.

CO2: describe the properties, synthesis, characteristics of nanomaterials, special nanomaterials and applications.

CO3: examine the structure, properties, applicability and characterization of nanomaterials.

CO4: analyze various synthesis procedures, characterizations and uses of carbon nanotubes, fullerene and graphene

CO5: discuss applications of nanomaterials of sensors and in optics and electronics

CO /PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to PSOs	3.0	3.0	3.0	3.0	3.0

POLYMER SCIENCE

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: explain classification of polymers, elastomers, fibres and liquid resins

CO2: explain addition and condensation polymerization, mechanical properties of polymers

CO3: determine the molecular weight of polymers, and explain the thermal properties of polymers

CO4: explain reactions of polymers and polymer processing

CO5: discuss speciality polymers like PVC, PMMA, rubbers, biodegradable polymers

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to POs	3.0	3.0	3.0	3.0	3.0

PHARMACEUTICAL CHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs) On completion of the course the students should be able to

CO1: Define the pharmaceutical terminologies; describe the principles in pharmacological activity, drug development, clinical chemistry, hematology, therapeutic drugs and treatment of diseases; list the types of IPR and trademarks.

CO2: Discuss the development of drugs, structural activity, disease types, physio- chemical properties of therapeutic agents, significance of medicinal plants, clinical tests and factors for patentability.

CO3: Apply the principles involved in structural activity and drug designing, functions of haematological agents; estimation of clinical parameters and therapeutic application of drugs for major diseases.

CO4: explain classification of analgesics and anesthetics, and physiological functions of plasma proteins

CO5: explain the significance of clinical tests like blood urea, serum proteins and coronary risk index

CO /PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

DEPARTMENT OF CHEMISTRY PROGRAMME OUTCOMES

On successful completion of the programme the students will be able to

PSO1: acquire in-depth knowledge of the fundamental concepts in all disciplines of chemistry.

PSO2: disseminate the basics of chemistry and advanced topics and analytical skills in organic, inorganic and physical chemistry.

PSO3: uphold ethical values in personal life, research and career.

PSO4: demonstrate laboratory skills, analytical acumen, creatively in academics and research.

PSO5: apply digital tools to collect, analyse and interpret data and presents scientific findings.

PSO6: gain competence to pursue higher education and career opportunities in chemistry and allied fields.

PSO7: exhibit leadership qualities to work individually and within a team in organizing curricular, co-curricular and extracurricular activities.

PSO8: apply the concepts of chemistry to solve problems in the community, entrepreneurial and research pursuits.

PSO9: exhibit competence in educational, industrial and research pursuits that contribute towards the holistic development of self and community.

PSO10: display proactive approach towards sustainable environment through green laboratory practices.