Course outcome Semester wise

Course: BSc

Subject: Chemistry I Semester

• The fundamental properties and basic model of atoms, simple quantum mechanical treatments of atoms and shapes of the orbitals which are important to understand the reaction mechanism and formation of molecule.

- The arrangement of elements in the periodic table in different blocks and the variation of different properties in the periodic table and the factors responsible for the variation.
- Basic concept of organic chemistry identify basic types of chemical reactions in organic chemistry.
- Types of indicators used in different reactions and the theory involved in it, miscibility of different liquid mixtures at respective temperatures, principles of fractional distillation and applications, distribution laws and applications and the students will be able to work out numerical problems.
- Use of the concept of the mole in quantitative chemical calculations, understand stoichiometric relationshipinvolved in reactions.
- Use of different methods of purification of compound and naming of different organic compounds in IUPAC system. Role of organic compounds in daily life.

II Semester

- The bonding fundamentals of ionic and covalent compounds, including bond energies using MO diagrams.
- Predicting geometries of simple molecules with the use of theory.
- Stability of conformational isomers of cycloalkanes, naming of different aromatic hydrocarbons different naming reactions aromatic derivatives, and effect of nature of alkyl groups, leaving groups, nucleophiles and solvents on nucleophilic substitution reaction.

Students learn how reaction rates are measured and represented in rates laws and application of chemical kinetics.

- Ionic equilibria; theory of strong electrolytes, degree of hydrolysis, effect of temperature and dilution on degree of hydrolysis.
- Preparation and synthetic applications of organic reagents, types and classification of polymers, solving numerical problems on determination of molar mass of polymer.
- Comparison of organic and inorganic precipitates how soaps and detergents act on dirt in cleaning process.

III Semester

• Position of the transition elements in the periodic table, chemistry of inner transition elements, chemistry of organometallic compounds and structures of few rare organometallic compounds.

- Types of alcohols and their preparations and uses, classification of phenols, why phenol is corrosive and few naming reaction associated with phenols, chemistry of ethers, epoxides, crown ethers and carbonyl compounds and the mechanism involved with few important reactions.
- Need for the thermodynamics of second law, significance of entropy, calculating bond energy, bond dissociation energy and resonance energy using thermodynamic data.
- X-ray crystallographycal studies and numerical problems in solving the crystals, different cromatographycal techniques and its use in separation, knowledge of different energy sources, fundamental uniqueness of the chemical and physical properties of nanomaterials and their potential impact in science, methods of nanomaterials preparation, aminoacids which are the building blocks of proteins and one can think of constructing new peptide bonds at nano level.

IV Semester

- Bonding in complexes and types, Concept of VBT and CFT in understanding the geometry of complexes, application of complexes in treating cancer and heavy metal poisoning, Ligan field theory which is the evidence for cbonding in complexes.
- Sterochemistry of organic compounds, types of isomerism in organic chemistry, classification of carbohydrates, structural elucidation of carbohydrates like glucose fructose.
- Partial structure of polysaccharides.
- Elemental quantum mechanics, concept of black body radiation, to determine equivalent conductance at infinite dilution for weak electrolyte, transport number, application of conductance measurements and conductometric titrations.
- Classification of acids and bases as Hard and Soft, gravimetric estimations and its advantages.
- Structure and synthesis of dyes.
- Concept of viscosity measurements, intermolecular forces, size and weight of the molecules, surface tension and parachor.

V Semester

- Industrial applications of inorganic chemistry in manufacturing of glass, ceramics, cements, study of paints in dept.
- Synthetic method of preparing terpenes, Synthesis of different class of heterocyles which play a very important role in pharmaceutical chemistry.
- Structure and classification of alkaloids, uric acids, vitamins, harmones, different chemotherapeutic agents and their synthesis.
- Photochemistry and radiation chemistry, new spectroscopic methods like IR, Raman Spectroscopy, molecular spectroscopy, electronic spectra.

VI Semester

- Types of metallurgy and metallurgical applications of inorganic chemistry in manufacturing of different metals and their purification.
- Production of ferro alloys.
- structure and role of metal ion in biological system with reference to Na+, K+ and Ca2+, Mg2+ ions , enzymatic role of metals in heamoglobin and myoglobin. Natyral pigments, hydroxyl
- synthesis of organic polymers by utilizing special techniques, classification and synthesis of nucleic acids, hydroxyl acids, diazonium compounds.
- Spectroscopic method of identification of compounds; IR, UV visible and NMR spectroscopy in depth.
- Electrochemistry ; cell construction, applications of EMF measurements, concept of phase equilibria, adsorption and kinetics of fast reactions and principles of techniques stopped flow method, flash photolysis, temperature jump method and pressure jump method.

Subject: Botany

I Semester

Microbial diversity, Algae, Fungi, Plant Pathology and Bryophytes

- Acquaint knowledge about distribution of microbes
- Importance and role of microbes
- Knowledge about diseases of economically important plants

II Semester

Pteridophytes, Gymnosperms, Anatomy of Angiosperms and Reproductive Biology

- Diversity of spore bearing plants
- Distribution of naked seeded plants
- Fossil formation and extinct plants
- Internal, epidermal structures of Angiosperms
- Reproductive Biology helps in understanding plant breeding, crop improvement activities

III Semester

Morphology and Taxonomy of Angiosperms and Plant Propagation

- Diversity of flowering plants
- Useful plants products
- Medicinal uses to cure ailments
- Learning the methods of propagation

IV Semester

Plant physiology and Evolution

- Knowledge of physiology helps in understanding the basic requirements of plants growth and development of plants.
- Unique features of plants like maintaining ecological balance by evolving oxygen and carbon dioxide etc.,
- Understand the evolving of present day plant groups

V Semester

Cell biology, Molecular Biology and Ecology (Elective 1)

- Learning basic structural organization at molecular level
- It helps in understanding the genetic engineering techniques
- Understand nature of plants with their habitat

VI Semester

Genetics, Genetic Engineering, Plant Breeding And Plant Biotechnology (Elective 3)

- Learning gene action in plants
- Importance of genetic engineering in the field of agriculture, medicine etc.,
- Knowledge about bringing new varieties of crop plants by plant breeding centres particularly in India

Subject: Zoology I Semester Animal Diversity I

- Diversity of non chordates
- Culture and study of microbes
- Develop knowledge about parasitic worms
- Insects and their role in nature

II Semester

Animal Diversity II

- Diversity of chordates
- Rich biodiversity of vertebrates
- Adaptations and migration of birds
- Comparative study of different classes

III Semester

Animal Physiology and Developmental Biology

- The role of environmental factors on physiological activities of animals
- Transmission of nerve impulses
- Reproductive process in higher animals
- Experiments on parthenogenesis

IV Semester

Cell Biology and Genetics

- Cell division pattern and events during meiosis
- Divers experiments on Drosophila
- Study of human genetics and its uses to mankind

V Semester

Biochemistry and Applied Zoology

- Functions of Bio molecules
- Role of enzymes and vitamins
- Knowledge about sericulture and vermi culture
- Role of vectors and parasites
- Wild life conservation and threats

VI Semester

Molecular cell biology, evolution and Ethology

- Study of tumors, its types and therapy
- Organic evolution and population genetics
- Animal behaviour, parental care in animals