

## **Programme Outcomes**

### ***Knowledge outcome:***

After completing B.Sc. Chemistry Programme students will be able to:-

**PO1:** Transfer and apply the acquired fundamental knowledge of chemistry, including Basic concepts and principles of 1) Organic chemistry, Inorganic chemistry and Physical Chemistry; 2) Experimental methods for chemistry to study different branches of chemistry;

**PO2:** Demonstrate the ability to explain the importance of the Periodic Table of the Elements and represent key aspects of it and its role in organizing chemical information.

### ***Program Specific Outcomes:***

After completing B. Sc. Chemistry, students will be able to:-

**PSO1:** Understand the nature and basic concepts of Physical, Organic and Inorganic Chemistry,

**PSO2:** Analyze Organic and inorganic compounds qualitatively and quantitatively;

PSO3: Understand the applications of physical, organic and inorganic chemistry in pharmaceutical, agriculture and chemical industries,

**PSO4:** Able to perform experimental procedures as per laboratory manual in the area of physical, Inorganic and organic chemistry,

**PSO5:** Interpretation and synthesis of chemical information and data obtained from Chemical and instrumental analysis.

### **Course Outcomes:**

## ***F.Y.B.Sc. Chemistry (Semester – I)***

### **Paper-I, Inorganic Chemistry:**

At the end of course student will be able to:-

**CO1:** define Atomic orbital's, Quantum numbers, Heisenberg uncertainty principle, shapes of s, p, d orbital's. Aufbau and Pauli exclusion principles. Hund's multiplicity rule. Bohr's atomic model

**CO2:** classify Atomic and Ionic radii, Ionization Energy, Electron affinity and Electro negativity.

**CO3:** describe diagonal relationship, salient features of hydrides, solvation and complexation tendencies including their functions in bio systems.

**CO4:** study (including diagonal relationship) the groups of 13-17 elements.

### **Paper-II, Organic Chemistry:**

At the end of course student will be able to:-

**CO1:** explain structure and bonding in molecule.

**CO2:** describe the various organic reaction mechanism, reactive intermediate, reagents. and energy.

**CO3:** discuss stereochemistry of various organic compound and determine R and S configuration of chiral molecule.

**CO4:** define methods of formation alkanes, Physical properties alkanes and Chemical reactions of alkanes.

**CO5:** describe the saytzeff rule, hafmann elimination, markownikoffs rule and polymerization for alkenes.

**CO6:** explain the aromaticity, side chain structure of benzene.

**CO7:** interpret the polyhalogen compound and method of formation of aryl halides. .

## ***F.Y.B.Sc. Chemistry (Semester – II)***

### **Paper-IV, Physical Chemistry:**

At the end of course student will able to:-

**CO1:** calculate logarithmic relation, slope of graph, and differentiation of various functions.

**CO2:** define kinetic theory of gases, Boyles law, Charles law and Avogadros hypothesis.

**CO3:** explain the rate of reaction for zero order, first order second order and pseudo order reaction and concept of activation energy.

**CO4:** distinguish between solid state, liquid state, gases state and liquid crystal.

**CO5:** explain types of solids and laws of crystallography and to derive Bragg equation.

**CO6:** describe various colloidal states that is sols, emulsions and gels.

### **Paper-V, Inorganic Chemistry:**

At the end of course student will able to know:-

**CO1:** explain chemical properties of the noble gases, chemistry of xenon.

**CO2:** discuss covalent bond, ionic bond, hydrogen bond and metallic bond.in molecule.

**CO3:** define atomic number, mass number, isotope, isobar binding energy radio activity and carbon dating technique.

**CO4:** define types of titrations, volumetric apparatus, calibration of pipette, burette. Indicators used in pH - titrations, oxidizing agents used in titrations.

### **Paper-(III+VI) Practical Chemistry:**

At the end of practical course student will able to -

**CO1:** Set up the apparatus properly for the given experiments. Perform all the activities in the laboratory with neatness and cleanness;

**CO2:** handle laboratory glassware's, hazardous chemicals safely in laboratory;

**CO3:** Determine equivalent weight of Mg.

**CO4:** Determine Viscosity of ethanol-water by viscometer measurement.

**CO5:** Maintain records of quantitative and qualitative analysis;

**CO6:** Acquire laboratory skills for preparation of 0.1N NaOH solution and standardization by oxalic acid solution.

**CO7:** Explain mole concept and its application in the preparation of normal and molar solutions, and use of mole concept in quantitative calculations.

**CO8:** apply the effect of acid strength on the hydrolysis of an ester.

**CO9:** perform verification of Lambert-Beers law using Colorimeter.

**CO10:** handle laboratory glassware's, hazardous chemicals safely in laboratory;

### **S.Y.B.Sc. Chemistry (Semester -III)**

#### **Paper-VII, Organic Chemistry:**

At the end of course student will be able to:-

**CO1:** define monohydric alcohols, dihydric Alcohols, trihydric Alcohols and reactions of Glycerol.

**CO2:** Describe preparation of Phenol, Physical properties, acidic nature of Phenol and mechanism involve in various reactions of Phenols.

**CO3:** Explain preparation, physical properties, Aldehyd, and mechanism involve in aldehydes and ketons.

**CO4:** define acidity of Carboxylic Acids, effects of substituents on acid strength, preparation, physical properties and reactions of Carboxylic Acids.

CO5: describe the preparation of various organic compound with nitrogen.

### **Paper-VII, Physical Chemistry:**

At the end of course student will be able to:–

**CO1:** Define terms like System, Surrounding, intensive, extensive properties and thermodynamic Process, laws of Thermodynamics, Internal energy, Enthalpy. Heat capacity and Hess's law of heat Summation and its application.

**CO2:** explain Carnot Cycle, its efficiency, Carnot Theorem, Concept of Entropy, entropy change in Physical change, Entropy as criteria of Spontaneity & Equilibrium, Gibbs and Helmholtz Functions.

**CO3:** discuss equilibrium constant, free Energy, thermodynamic Derivation of Law of Mass Action, Le Chatelier's Principle, reaction Isotherm, Reaction Isochore and Clausius-Clapeyron Equation.

### **S.Y.B.Sc. Chemistry (Semester -IV)**

#### **Paper-X, Inorganic Chemistry:**

At the end of course student will be able to:–

**CO1:** discuss the general Characteristic features of d-block elements, properties of the elements of the first transition series, ionization potential, magnetic properties and Oxidation State.

**CO2:** explain the Werner's Co-ordination theory and its experimental verification, effective atomic number concept, chelates, nomenclature of co-ordination compounds, isomerism in co-ordination compounds.

**CO3:** explain occurrence, isolation and application of Lanthanides.

**CO4:** interpret position of actinides in the periodic table, electronic configuration. oxidation State and chemistry of separation of Np, Pu and Am from U

**CO5:** describe various theories of concept of Acids and Bases.

**CO6:** define physical properties of a solvent, types of solvents and their general

Characteristics.

**Paper-XI, Physical Chemistry:**

At the end of course student will be able to:–

**CO1:** discuss the terms: Phase, Component, Degree of Freedom, Derivation of Phase Rule Equation. Phase Equilibrium of the One Component, Two Components System Solid Solutions: Raoult's Law and Henry's Law. Ideal and Non-Ideal, Ethanol-Water System.

**CO2:** classify the conduction in metals and in Electrolyte Solutions and define Kohlrausch's law, Arrhenius Theory of Electrolyte Dissociation and its limitations,

**CO3:** explain Weak and Strong Electrolytes, Ostwald's Dilution Law, and Conductometric Titration its Types and advantages.

**CO4:** define the types of Reversible Electrodes, Nernst Equation, Derivation of Cell, E.M.F. and single Electrode potential, Standard Hydrogen Electrode, Reference Electrodes, Standard Electrode Potential, Sign Conventions, Electro-Chemical Series and its significance.

**Paper-(IX+XII) Practical Chemistry:**

After completion of practical course student should be able to

CO1: Laboratory skills for the purpose handling different equipment's

CO2: determine critical solution temperature of phenol- water system.

CO3: determine the solubility of benzoic acid at different temperature.

CO4: determine the refractive index of ethanol –water system.

CO5: determine heat of neutralization of NaOH and HCL/ Acetic Acid.

CO6: Determination of molecular mass of polymer from viscosity measurement.

CO7: the estimation of Nickel gravimetrically as Ni-DMG complex.

CO8: preparation of benzoyl derivative of Anilene b-Naphthol

CO9: estimation of ester by hydrolysis.

CO10: determination of normality and strength of HCL/Acetic Acid using 0.1N NaOH solution

### ***T.Y.B.Sc. Chemistry (Semester -V)***

#### **Paper-XIII, Physical Chemistry:**

At the end of course student will be able to:-

**CO1:** explain Black body radiation, Planck's radiation law, photoelectric effect, Bohr's modes of hydrogen atom. Compton effect, De Broglie Hypothesis, the Heisenberg's uncertainty principles, Hamiltonian operator, Schrödinger wave equation and quantum numbers.

**CO2:** discuss electromagnetic radiation, basic features of different spectrometers, Rotational Spectrum - Diatomic molecules, energy levels of a rigid rotor, selection rule, and rotational spectra of rigid diatomic molecule and determination of bond length.

**CO3:** define introduction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry, Jablonski diagram, quantum yield and photosensitized reactions.

**CO4:** explain optical activity, dipole moment, magnetic property, Applications of optical activity.

**CO5:** explain the introduction of nano-materials, Methods of Synthesis and its application.

#### **Paper-XIV, Organic Chemistry:**

At the end of course student will be able to:-

**CO1:** interpret Nuclear magnetic resonance spectroscopy, Proton magnetic resonance spectroscopy and the structure elucidation of simple organic compounds using UV, IR spectroscopic techniques.

**CO2:** describe the Grignard reagent formation, structure and chemical reactions.

**CO3:** explain the preparation of aceto acetic ester, acidity of alpha hydrogen, properties and reactions involving formation of mono, di and unsaturated carboxylic acids.

**CO4:** understand the natural fats, edible and industrial oils of vegetable origin, manufacture of soya bean oil by solvent extraction method, isolation, uses of essential oils and types of animals fats and oils, saponification value, iodine value, acid value and Detergents.

**Paper-XVI, Inorganic Chemistry:**

At the end of course student will be able to:-

**CO1:** apply the Elementary idea of Crystal Field Theory, Crystal Field Splitting in Octahedral, Tetrahedral and Square Planar Complexes and Factors affecting Crystal Field Parameters.

**CO2:** discuss the types of Electronic Transitions, Selection rules for d -d transitions, Energy level diagram for d1, d5 and d9 Electronic Spectrum of [Ti (H<sub>2</sub>O)<sub>6</sub>]<sup>3+</sup> complex ion.

**CO3:** define preparation, properties, Bonding, Applications of alkyls and aryls of - Li, Al, Hg, Sn and Ti.

**CO4:** explain the Essential and trace elements in biological processes.

**CO5:** classify the chromatography Paper and Thin Layer Chromatography and Method of development Locating Technique, R f value Comparison between paper and TLC Applications.

**Paper-XVII, Organic Chemistry:**

At the end of course student will be able to:-



**CO1:** write the molecular orbital picture and aromatic characteristics of heterocyclic compound and mechanism of nucleophilic substitution reactions in heterocyclic compound.

**CO2:** define interconversion of Glucose and Fructose, Mechanism of Mutarotation and Introduction to disaccharides and Polysaccharides without involving structure determination.

**CO3:** explain introduction, Classification, Properties and use of synthetic polymers

**CO4:** explain the colour, constitution of dye and classification based on chemical constitution.

**Paper-(XV+XVIII) Practical Chemistry:**

After completion of practical course student should be able to–

**CO1:** Maintaining records of chemical and instrumental analysis.

**CO2:** Laboratory skills for the purpose of collecting, interpreting, analysing, of various practical data.

**CO3:** Laboratory skills for the purpose handling different analytical instruments.

**CO4:** Interpretation of results of experiment and their correlation with theory.

**CO5:** Study of conduct metric, potentiometric, and pH metric principles.

**CO6:** Apply of conduct metric, potentiometric, colorimetric and pH metric measurement in quantitative analysis. .

**CO7:** apply the use of Refractometric measurement and its application.

**CO8:** Maintaining records of quantitative and qualitative analysis.

**CO9:** Laboratory skills for the purpose of collecting, interpreting, analysing, and reporting of chemical data.

**CO10:** Separation and identification skill of various binary mixtures.

**CO11:** Identify methods and instruments that can be used qualitative and quantitative analysis.

**CO12:** understand Mole concept and its application in the preparation of normal and molar solutions, and use of mole concept in quantitative calculations for inorganic analysis

**CO13:** Synthesis and purify coordination compounds.

**CO14:** Statistical treatment to quantitative data

**CO15:** Perform organic synthesis and follow the progress of the reaction by using TLC technique

## **Department of Mathematics**

### **Program Outcomes:**

**PO1:** The importance of mathematics and investigate the real world problems and learn to how to apply mathematical ideas and models to those problems.

**PO2:** Investigate and apply mathematical problems and solutions in a variety of contexts related to science, technology, business and industry, and illustrate these solutions using symbolic, numeric, or graphical methods.

**PO3:** Find the type and solve abstract mathematical problems and give geometrical interpretation of various concepts.

**PO4:** Known connections between different subjects in mathematics.

**PO5:** Formulate and analyze mathematical problems, precisely define the key terms, and draw clear and reasonable conclusions.

**PO6:** Promote the students to enhance their knowledge in soft skills and Computing skills.

**PO7:** Enable the students to equip knowledge in various concepts involved in

Mathematics.

## **Course Outcomes:**

### **F.Y.B. Sc (Mathematics)**

#### **MAT 101: Calculus I (Sem. I)**

**CO1:** After completion of this course student will know Functions, Limit, Continuity, Differentiation, hyperbolic and inverse functions, their properties and derivatives.

**CO2:** To know the knowledge and skill to find some standard results of successive differentiation,  $n^{\text{th}}$  derivatives of powers of sines and cosines.

**CO3:** Explain Leibnitz's theorem and solve  $n^{\text{th}}$  derivatives of rational functions.

**CO4:** Student will able to know Mean value theorems, meaning of sign of derivatives. Describe the concept of higher derivatives, theorems. Compute Taylor's and Maclaurin's expansions of some functions.

**CO5:** Student will know Partial differentiation, total differentiation, derive theorems and solve examples.

**CO6:** Student will able to know scalar, vector function, directional derivatives, Gradient, divergence and curl, derive some properties and solve examples.

#### **MAT 102: Differential Equations (Sem- I)**

**CO1:** Define the terms differential equation, order, degree, exact differential equation, exact condition, Linear equation, Bernoulli's equation,

**CO2:** Find complementary function, particular integral, complete integral, case of auxiliary equations, short method of finding particular integral.

**CO3:** Define homogeneous linear equation, method of finding the solution of particular integrals. Equation reducible to homogeneous linear form.

**CO4:** Define exact differential equation, solution of exact differential equations, first integral forms of the differential equations.

**CO5:** Solve of the simultaneous diff . equations which are linear and of the first order.

**CO6:** Define partial diff. equation, explain the method of PDE by elimination of constants and arbitrary function.

### **MAT 201 Calculus II (Sem. II)**

**CO1:** After completion of this course student will able to learn reduction formulae of Some standard functions, trigonometric functions..

**CO2:** To learn integrations of algebraic rational functions.

**CO3:** To develop the knowledge of application of integration in evaluating the length of arc, area, Volume of revolution of a curve.

**CO4:** To develop the knowledge about surface and line integral.

**CO5:** Student will know evaluation of integrals using Green's, Stoke's and Guass theorems.

### **MAT 202 : Geometry (Sem- II)**

**CO1:** Explain the concepts of Geometry by using basic definitions.

**CO2:** Calculate shortest distance between skew lines, radius, centre of sphere and angle between planes and lines, cylinder, cone by using some formulae.

**CO3:** Determine the condition of tangency for the Sphere by using basic formulae.

**CO4:** Define central conicoid, intersection of line and central conicoid, equations of tangent lines and tangent plane, find the condition that a plane may touch a central conicoid.

### **S. Y. B. Sc (Mathematics)**

#### **MAT 301: Number Theory (Sem- III)**

**CO1:** Define the terms division algorithm, gcd, lcm, Euclidean algorithm, solve the Diophantine equations.

**CO2:** Explain the fundamental theorem of arithmetic.

**CO3:** Explain Fermat 's thm, Little thm, Willson's thm.

**CO4:** Define the function Toe and sigma, explain the Mobius inversion formulae .

**CO5:** Define Euler phi – function and explain Euler's thm.

### **MAT 302 : Integral Transform (Sem- III)**

**CO1:** Define the terms beta and gamma function, properties of gamma function, relation of between beta and gamma function.

**CO2:** Define the terms piece-wise continuous function , exponential order, function of class A, Laplace transform , some standard results of L.T.

**CO3:** Define the inverse of L.T. Null function , some thm on inverse of L.T. Example of inverse of L.T. Partial fraction , Heaviside expansion formula.

**CO4:** Application of L.T. to the differential equations.

**CO5:** Define the Fourier sine and cosine transform, find the relation between Fourier and Laplace transform, finite Fourier sine and cosine transform, explain Fourier integral thm.

### **MAT 303 Mechanics I (Sem. III)**

**CO1:** After completion of this course student will able to learn forces acting on a particle, equilibrium of forces acting on a particle.

**CO2:** To learn forces acting on a rigid body.

**CO3:** Define Centroid and Centre of gravity and to learn Centre of gravities of some standard uniform bodies like rod, triangular lamina and parallelogram.

### **MAT 401 : Numerical Methods (Sem- IV)**

**CO1:** Recall definitions and formulae of various numerical methods for finding roots of the equations, interpolation,

**CO2:** Explain least square curve fitting procedures, explain method of fitting of straight line and non-linear curve fitting, find the Chebyshev polynomials.

**CO3:** Solution of linear system of equation by different numerical method.

**CO4:** Solution of ordinary differential equations by using numerical methods.

**CO5:** Solve the problems in Numerical methods, apply theorem to find numerical solution.

**CO6:** Explain concepts of numerical methods and evaluate problems.

### **MAT 402 : Partial Differential Equations (Sem- IV)**

**CO1:** Define the terms PDE, Lagrange's Linear PDE, Explain method of the Lagrange's LPDE.

**CO2:** Define the terms complete integral, particular integrals, general integrals, singular integrals, explain the standard forms I to IV, solve the non-linear PDE of order one by using Charpit's method and Jacobi's method.

**CO3:** Define the linear homogeneous PDE, non-homogeneous linear PDE, explain the method the equation reducible to linear form with constant coefficient.

**CO4:** Solve the PDE of second order by using Monge's method and method of transformation.

### **MAT 403 Mechanics I (Sem. IV)**

**CO1:** After completion of this course student will be able to learn kinematics and dynamics of a particle in two dimensions.

**CO2:** Expressions for velocity and acceleration and their components in different directions.

**CO3:** To learn Newton's law of motions and their deductions.

**CO4:** To develop the knowledge about momentum, Impact of bodies, Energy, field and conservative field of force, potential function.

**CO5:** Student will able to learn rectilinear motion, Projectile, Equation of projectile, Time of flight, horizontal range and highest point of trajectory and parabola of safety.

**CO6:** Student will able to learn kepler's laws of planetary motions.

**CO7:** Define central orbit, Apses, law of force. Evaluate the differential equation of the central orbit in polar and pedal form.

### **T. Y. B. Sc.**

#### **MAT 501 Real Analysis I (Sem. V)**

**CO1:** After completion of this course student will able to know functions, sequence and series of real numbers and their convergence and divergence.

**CO2:** To learn bonded sequence.

**CO3:** To learn Jacobian's, Derive theorems and solve examples.

#### **MAT 502: Abstract Algebra -I (Sem - V)**

**CO1:** Define the terms group, subgroup, normal subgroup, factor group, cyclic group, some preliminary lemma on group and subgroups, explain Lagrange's thm.

**CO2:** Justify converse of Lagrange's thm in Group Theory by giving counter examples.

**CO3:** Give examples of group, subgroup, abelian group, normal group, factor group, cyclic group.

**CO4:** Solve examples to find order of quotient group, left cosets, right cosets, Direct products.

**CO5:** Classify the normal, quotient group, Classify the groups as homomorphic and non-homomorphic,

**CO6:** Define the terms ring, subring, integral domain, Field, the definitions and illustrate it giving examples, define the integral domain, Field.

**CO7:** Solve examples of ideals, prime, principal and maximal ideals, Apply the theorems for solving examples of finding elements of factor ring, irreducible polynomials.

### **MAT 504 Ordinary differential equation I (Sem. V)**

**CO1:** Student will able to know sums, difference, product, quotient, conjugate, modulus and argument of complex numbers

**CO2:** Calculate exponentials of complex numbers.

**CO3:** Solve problems on the basic concept of modulus, arguments of complex numbers, De-moivre's theorem use them to find roots.

**CO4:** Solve linear differential equations with constant coefficients, non homogeneous differential equations of first order and first degree equations.

**CO5:** Solve linear differential equation by power series method

### **MAT 601 Real Analysis II (Sem. VI)**

**CO1:** Define the concept of metric space and learn basic concepts of open sets, limit point, closure of set and closed sets.

**CO2:** To learn continuity of a function defined in metric space.

**CO3:** To learn concept of compactness, connectedness and completeness.

**CO4:** Evaluate Fourier series expansion for given functions.

**CO5:** Find cosine and sine series for given functions.

### **MAT 602: Abstract Algebra -II (Sem - VI)**



**CO1:** Define concepts as Vector Spaces, subspace, span, kernel, linearly dependent etc.

**CO2:** Describe spanning of vector space, inner product of vectors, linear transformation for set of vectors.

**CO3:** Give counter examples of vector space and subspace, linear dependence, basis set.

**CO4:** Apply dimension theorem to find nullity and dimension of vector space.

**CO5:** Calculate coordinate vector, orthogonality, orthonormality, norm of vectors using formulas, Explain Gram Schmidt process to convert basis to orthonormal basis.

**CO6:** Define the terms modules, R-modules sub-modules and its examples. Some theorems on modules and sub- modules.

### **MAT 604 Ordinary differential equation II (Sem. VI)**

**CO1:** Student will able to know initial value problem for the homogeneous equation, reduction of order of a homogeneous equation, Legendre polynomial.

**CO2:** To learn expression of existence theorem and uniqueness theorems.

**CO3:** Find linearly independent power series solution of differential equations with variable coefficients.

**CO4:** Solve linear differential equations with regular singular points.

## **Department of Physics**

### **B. Sc. Physics**

#### **Programme outcome**

**PO 1:** The programme enables the students to understand basic facts and concepts in physics while retaining the exciting aspects of physics so as to develop interest in the study of physics as a discipline

**PO 2:** To develop the ability to apply the principles of physics

**PO 3:** To appreciate the achievements in physics and to know the role of physics in nature and in society

**PO 4:** To develop problem solving skill

**PO 5:** To be familiarized with the emerging areas of physics and their application in various spheres of physical science and to appraise the students of its relevance in future studies

**PO 6:** To develop skills in the proper handling of apparatus

**PO 7:** To be exposed to the different process used in industries and their application

**PO 8:** To produce graduates who excel in the competencies and values required for leadership to serve a rapidly evolving global community

**PO 9:** To motivate the students to pursue PG courses in reputed institutes

**PO 10:** To kindle the interest for research in students

**PO 11:** To acquire placement in educational institutions, engineering and industrial firms.

**PO12:** To endow the students with creative and analytical skills; this will equip them to become entrepreneurs. The syllabi are framed in such a way that it bridges the gap between the plus two and post graduate levels of Physics by providing a more complete and logical framework in almost all areas of basic Physics.

**Course outcome**

## **First year**

### **Semester I**

#### **CO-PHY 101 – Mechanics, Properties of Matter and Sound**

**objective:** Knowing the Mechanical properties of body using Newton' low of gravitation calculating gravitational field gravitational potential of solid sphere and spherical shell at a point inside and on the surface, knowing elastic properties, viscosity and surface tension of a body , ultrasonic and acoustics laws and terms.

#### **CO-PHY 102 – Heat and Thermodynamics**

**Objective:** To study the behavior of solid liquid and gases and their properties by the variation of temperature changes, calculation thermal conductivity real gases phenomenon variation of mean free path with temperature, knowing the thermodynamics of a system working of different engines and also entropy and thermodynamic relations

**CO- PHY 103** – Verification of theoretical knowledge by experimental work in laboratory and the aim of practical is verified.

### **Semester II**

#### **CO-PHY 104 – Geometrical and Physical Optics**

**Objective:** For the study of optical concept and its uses and importance.

#### **CO – PHY 105 – Electricity and Magnetism**

**Objective:** Understanding the concept of electricity and magnetism and their phenomenon

**CO – PHY 106** Verification of theoretical knowledge by experimental work in laboratory and the aim of practical is verified.

## **Second year**

### **Semester III**

#### **CO – PHY 201 – Mathematical Statistical Physics and Relativity**

**Objective:** Understand and finding the probability of different statics.

#### **CO – PHY 202 – Modern and Nuclear Physics,**

**Objective:** To study of different phenomenon and its principle of photo electric effect, x-ray,

nuclear forces and models, particle accelerators and detectors

**CO – PHY 203 –** Verification of theoretical knowledge by experimental work in laboratory

and the aim of practical is verified.

**CO – PHY 204 –** Verification of theoretical knowledge by experimental work in laboratory

and the aim of practical is verified.

### **Semester IV**

#### **CO – PHY 205 – General Electronics**

**Objective:** Study of different circuit diagram its working and functioning.

#### **CO – PHY 206 – Solid State Physics**

**Objective:** Understand about different solid state material its structure and bonding.

**CO – PHY 207 –** Verification of theoretical knowledge by experimental work in laboratory

and the aim of practical is verified.

**CO – PHY 208 –** Verification of theoretical knowledge by experimental work in laboratory

and the aim of practical is verified.

## **Third year**

### **Semester V**

#### **CO – PHY 301 – Classical and Quantum Mechanics,**

**Objective:** Study of difference between Newtonian mechanics and quantum concept and theory

#### **CO – PHY 302 – Electrodynamics**

**Objective:** Understanding of different concept of electrostatics, time varying field, electromagnetic waves integration of electromagnetic waves with matter and boundary conditions

**CO – PHY 303** – Verification of theoretical knowledge by experimental work in laboratory and the aim of practical is verified.

**CO – PHY 304** - Verification of theoretical knowledge by experimental work in laboratory and the aim of practical is verified.

### **Semester VI**

#### **CO – PHY 305 – Atomic Molecular Physics and Laser,**

**Objective:** Study of atomic and molecular phenomenon and different types of laser.

#### **CO – PHY 306 – Non Conventional Energy Sources and Optical Fiber**

**Objective:** To understand the importance of renewable energy, and fabrication of optical

fiber.

**CO – PHY 307** – Verification of theoretical knowledge by experimental work in laboratory

and the aim of practical is verified.

**CO – PHY 308** – Verification of theoretical knowledge by experimental work in laboratory

and the aim of practical is verified.

## **Dept. of Botany**

### **Course out Come:-**

- 1] The Student acquires knowledge about General characteristics, morphology, anatomy and reproductive Biology in Pteridophytes, Gymnosperms and fossil.
- 2] The students learn about general characteristic, morphology, reproduction and economic importance of algae, fungi and Bryophyte
- 3] The student become familiarize themselves with Angiosperms like its Taxonomy, Morphology, Embryology and Anatomy,
- 4] The student becomes competent in understanding plant physiological process, plant metabolism and ecology, phytogeography.
- 5] The student acquires preliminary knowledge, cell biology, Genetics, molecular biology and Biotechnology.

### **B.Sc.F.Y. Seme – I**

#### **Paper.No. I: - Diversity of cryptogams**

- 1] Knowledge and understanding about plant diversity.
- 2] Carrier opportunities and job opportunities.
- 3] After competition of this course the student gre expected to describe the cryptogams, plant

diversity like viruses my coplasm, Bacteria, Lichens Algue and Fungi

**Paper- II: - Morphnology of Angiosperm:-**

1] It gives knowledge of indentification of flowering plants and its classification system

uptogenus tu species level and also describes economic importance.

2] It gives knowledge different plant families and species of Angiospermic plant and describe

conservation method of different plants.

**B.Sc.F.Y. Seme – II**

**Paper No - IV Diversity of scytogams= II**

1] After completion of this course the students are expected to describe the cryprograms plant

diversity like Bryophytes and pteridophytes.

2] Understand the morphological diversity of Bryophytes and economic importance of

Bryophytes and pteridophytes :-

**Paper No- V Histology, Anaantomy and Embryology.**

1] After completion of this course students are expected to describe the morphology of

angiosperm plant and its histology, Anatomy & Embryology.

2] The general term, anatomy for the study of internal structure of plants.

**B.Sc.S.Y. Seme – III**

**Paper.No. VII- Taxonomy of Angiosperms:-**

1] Understand the systems of classification of Angiosperms, nomenclature and interdisciplanory

approaches.

- 2] Recognize members of the major Angiosperms
- 3] Families by identifying their diagnostic features and economic importance

**Paper. No. – VIII –Plant ecology: -**

- 1) After completion the course the students are expected how to conserve soil and water.
- 2) To understand how to control air, water and noise pollution.

**B.Sc.S.Y. Sem – IV**

**Paper.No. XI Gymnosperm and utilization of plant: -**

- 1) After competition of this course students are expected to, it describe Gymnosperm and utilization of plants.
- 2) After competition of this course, students are well known about economic importance of Cycas , Pinus and Gnetum .

**B.Sc.S.Y. Sem –IV**

**Paper No.XII Plant Physiology. Sem-IV**

- 1) To understand the process of photosynthesis in higher plants with particular emphasis on light and dark reaction, C3 and C4 pathway.
- 2) To understand the plants and plant cells in relation to water.

**B.Sc.T.Y. Sem –V**

**Paper.No.XV. – Cell Biology and molecular biology**

- 1) On completion of the course students of the course students are able to understand the eukaryotic cell cycle and able to understand the eukaryotic cell cycle and mitotic and



meiotic cell division.

2) In this subject students will understand the cell at molecular level as well as how the process like replication of DNA occurred.

**Paper.No. XVI. Microbiology and Disease Management**

1) Accurately interpretation of collected information and use taxonomical information to evaluate and formulate position of plant in taxonomy.

2) To understand plant morphology and basic taxonomy.

**B.Sc. T.Y. Sem – VI.**

**Paper.No.XIX. Genetics and Biotechnology.**

1) Students are able to understand Mendel's law of inheritance.

2) Students understand different type of genetic interaction.

3) Students know about genetic engineering.

**Paper.No.XX. Plant Pathology [C]**

1) Students understand the role of plants in human welfare.

2) To gain knowledge about various plants and plants or economic use.

3) To know importance of plants and plant products.

**Dept. of Zoology.**

**Program outcome:-**

1] The Student acquires knowledge about General characteristics, morphology, anatomy and Physiology in different types of invertebrate and vertebrate animals and fossil.

2] The students learn about general characteristic of cell and cell organelles with their str. & functions.

3] The student become familiarize themselves with museum specimen and slides of relevant invertebrates & protochordata.

4] The student becomes competent in understanding animal dissections methods.

5] The student acquires preliminary knowledge, cell biology, Genetics, molecular biology. Ecology, Evolution, Fishery science and Biotechnology.

### **Course outcome:-**

#### **B.Sc.F.Y. Seme - I**

##### **Paper.No.I: - Protozoa to Annelida. (ZOL-101)**

1] Knowledge and understanding about Animal classification and general characters.

2] After completion of this course the student is expected to describe morphology, classification. Life cycle of various animals.

##### **Paper- II: -Cell biology.(ZOL-102)**

1] It gives knowledge about str.and functions of cells, methods in cell biology.

2] It gives knowledge about microscope and microtechniques.

#### **B.Sc.F.Y. Seme - II**

##### **Paper No -IV Arthropoda to Echinodermata and Protochordata.( ZOL-201)**

1] After completion of this course the students are expected to describe general characters and classification of animals from Arthropoda to Echinodermata.

**Paper No- V Genetics-I ZOL-202)** 1] After completion of this course students are expected to describe the different genetical terms, gene interactions, cytoplasmic inheritance, sex determination, mutations.etc.

### **B.Sc.S.Y. Seme – III**

#### **Paper.No. VII- Vertebrate Zoology (ZOL-301)**

1) During this course student will be able to describe Classification and general characters of different vertebrate animals.

#### **Paper. No. – VIII – Genetics- II (ZOL-302)**

1) After completion of the course the students are expected to explain sex linked inheritance, concept and significance of genetic Engineering, genetic code,

2) To understand Inborn errors in metabolism, genetic disorders, and DNA fingerprints.

### **B.Sc.S.Y.Sem– IV**

#### **Paper.No. XI Animal Physiology.(ZOL-401)**

1) After completion of this course students are expected to understand physiology of various

### **B.Sc.S.Y.Sem –IV**

#### **Paper No.XII Biochemistry and Endocrinology.( ZOL-402)**

1) During this course students will understand the process of metabolism of organic compounds., Mechanism of enzyme action.

2) To understand structure and function of different endocrine glands.

### **B.Sc.T.Y.Sem –V**

#### **Paper.No.XV. Ecology ( ZOL-501)**

1) In this course students will be able to understand concept , terminology used in ecology.and different environmental factors.

2) To understand concept and types ecosystems.

#### **Paper.No.XVI. Fishery Science – I ( Elective paper ZOL–502)**

1) During this course students will understand history of fishery science, classification & importance of fishes.

2) To understand different types of fisheries, remote sensing technique in fisheries.

**B.Sc.T.Y.Sem – VI**

**Paper.No.XIX. Evolution (ZOL-601)**

1) During this course students will be able to understand concept of organic evolution, origin of life, basic pattern of evolution, etc.

**Paper.No.XX. Elective paper-- Fishery Science-II ( ZOL-602)**

- 1) Students understand the role of fishery science in human welfare.
- 2) To gain knowledge about side business for farmers related with fishery.
- 3) To know importance of fish breeding and fish production,
- 4) To gain knowledge about types of Craft and gears used in fishery science.