

B.Sc. B.Ed. (Integrated)

Program Outcome (Po's)

After the successful completion of four years B.Sc.B.Ed. program, students teacher will be able to develop:

Content Knowledge:

- Students will be able to get exposed to a strong theoretical and practical background fundamental concepts of sciences of different subject areas.
- Depending on the student's specialization these areas include Chemistry, Physics, Mathematics, Botany, Zoology.
- The student will determine the appropriate level of technology for use in
 - a) experimental design and implementation,
 - b) analysis of experimental data and
 - c) numerical and mathematical methods in problem solutions.

Teaching competencies:

- Develops teaching ability of students through different lessons like microteaching, integration lessons, Simulation lessons, Practice lessons, Seminars, Presentations, etc.
- Develop competencies among student-teachers to select and use appropriate assessment strategies for facilitating learning.

Entrepreneurship:

- Students can start nursery, mushroom cultivation, biofertilizer production, fruit preservation and horticultural practices, tissue culture laboratory.
- Science graduates can go to serve in industries or may opt for establishing their industrial unit.
- Students can start classes, preschools, schools and able to do work as an expert.

Divergent thinking:

- Been able to think creatively to propose novel ideas in explaining facts and figures or providing a new solution to the problems.

- Employ critical thinking and scientific knowledge to design, carry out, record, and analyse the results of chemical reactions.

Value and Skill development:

- Imbibed, social, moral, ethical, personal, and social life leading to highly cultured and civilized personality.
- Develop scientific temper and thus prove more beneficial to make a nation grow at a rapid pace.
- Holistic development and academic excellence contribute effectively to the understanding of the subject along with sensitizing the students towards the need for keeping the environment clean and conserve our natural resources.
- Build the right attitude, values needed for the teaching profession.

Use of ICT:

- Compilation and interpretation of Biological data using computer software.
- Use modern techniques, decent equipment, and Chemistry software.

Leadership Skill:

- Students drive the team by working together in art and drama, social service, group activities.
- Developed flair by participating in various social and cultural activities voluntarily, to spread knowledge, creating awareness about the social evils, blind faith.

B.Sc.B.Ed.

PROGRAM SPECIFIC OUTCOMES (PSO's)

Program specific Outcomes of B.Sc.B.Ed. Program are as follows

After the successful completion of four years B.Sc.B.Ed. program, students teacher will be able to develop: Content Knowledge:

- a) Students will be able to get exposed to a strong theoretical and practical background in fundamental concepts of sciences of different subject areas.
- b) Depending on the student's specialization these areas include Chemistry, Physics, Mathematics, Botany, Zoology.
- c) The student will determine the appropriate level of technology for use in
 - i) experimental design and implementation,
 - ii) analysis of experimental data and
 - iii) numerical and mathematical methods in problem solutions. Teaching competencies:
 - d) Develops teaching ability of students through different lessons like microteaching, integration lessons, Simulation lessons, Practice lessons, Seminars, Presentations, etc.
 - e) Develop competencies among student-teachers to select and use appropriate assessment strategies for facilitating learning. Entrepreneurship.
 - f) Students can start nursery, mushroom cultivation, bio fertilizer production, fruit preservation and horticultural practices, tissue culture laboratory.
 - g) Science graduates can go to serve in industries or may opt for establishing their industrial unit.
 - h) Students can start classes, preschools, schools and able to do work as an expert. Divergent thinking:
 - i) Been able to think creatively to propose novel ideas in explaining facts and figures or providing a new solution to the problems.
 - j) Employ critical thinking and scientific knowledge to design, carry out, record, and analyse the results of chemical reactions. Value and Skill development:
 - k) Imbibed, social, moral, ethical, personal, and social life leading to highly cultured and civilized personality.
 - l) Develop scientific temper and thus prove more beneficial to make a nation grow at a rapid pace.
 - m) Holistic development and academic excellence contribute effectively to the understanding of the subject along with sensitizing the students towards the need for keeping the environment clean and conserve our natural resources.
 - n) Build the right attitude, values needed for the teaching profession. Use of ICT: Compilation and interpretation of Biological data using computer software.
 - o) Use modern techniques, decent equipment, and Chemistry software. Leadership Skill:

- p) Students drive the team by working together in art and drama, social service, group activities.
- q) Developed flair by participating in various social and cultural activities voluntarily, to spread knowledge, creating awareness about the social evils, blind faith.
Program Specific Outcome
- r) Demonstrate, solve, and understanding major concepts in all disciplines of chemistry.
- s) To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.
- t) Students will also be able to obtain an overview of phylogenetic relationships and evolutionary trends of these organisms
- u) Botany covers a wide range of scientific disciplines concerned with the study of plants, algae, and fungi, including structure, growth, reproduction, metabolism, development, diseases, chemical properties, and evolutionary relationships among taxonomic groups.
- v) Acquired the skills in handling scientific instruments, planning, and performing laboratory experiments.
- w) Demonstrate a rigorous understanding of the core theories & principles of physics, which includes mechanics, electromagnetism, thermodynamics, & quantum mechanics. Learn the Concepts as Quantum Mechanics, Relativity, introduced at the degree level to understand nature at atomic levels.
- x) A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology, and cognize basic geometrical figures and graphical displays, state important facts resulting from their studies.

B.Sc. B.Ed. (Integrated)

Course outcomes

First Year B.Sc.B.Ed

1110 - Education for development in the 21st century

After Completion this course the student will be able to:

CO1. Demonstrate knowledge and understanding of the principles of music learning.
CO 2. Develop awareness of current practices of music teaching and learning in a variety of educational settings.

CO 3. Develop an ability to advocate for the role of music education in society.
CO 4. Understand the importance of singing in music education and display knowledge of how to engage students of a range of ages in vocal activities.
CO 5. Develop awareness of teaching and learning styles best suited to engage young children and adolescents in music.

1111- Physical chemistry and 1112-organic Chemistry.

After Completion this course the student will be able to:

CO1. Explain rules for filling electrons in various orbitals- Aufbau's principle, Pauli exclusion principle, Hund's rule of maximum multiplicity.

CO2. Know about thermodynamic principles to physical and chemical process

CO3. Know Exergonic and endergonic reaction.

CO4. Define various types of chemical bonds- Ionic, covalent, coordinate and metallic bond.

CO5. Understand the classification of elements as main group, transition and inner transition elements.

CO6. Understand Calculations of enthalpy, Bond energy, Bond dissociation energy, resonance energy

CO7. Understand Gas equilibrium, equilibrium constant and molecular interpretation of equilibrium constant

CO8. Apply application of Van'tHaff equation

CO9. Apply Third law of thermodynamic and its application.

1141-Plant life and Utilization-I, 1142-Plant Anatomy and Morphology

After Completion this course the student will be able to:

CO1. Know the symbiotic association between various organisms like lichen, mycorrhizae etc.

CO2. Know the economic importance and Structure of fungi, algae, bryophytes.

CO3. Familiarize the students with microbes and cryptogams. The students are made aware about the ecosystem so as to bring awareness on different aspects of Biodiversity and conservation of Biodiversity.

CO4. Understand various processes of plants like photosynthesis (particular emphasis on light and dark reactions), respiration, translocation, absorption and nitrogen metabolism. The students also get an insight into the various types of plant movements.

CO5. Understand the diversity among algae, fungi, bryophytes and pteridophytes. Understand structural adaptations in plants growing in different environments.

CO6. To create awareness about cultivation, conservation and sustainable utilization of biodiversity.

1131 Mechanics, properties of matter and 1132-Physics principle and application.

After Completion this course the student will be able to:

CO1. Foster scientific attitude, provide in-depth knowledge of scientific and technological concepts of Physics.

CO2. To enrich knowledge of basic physics through problem solving, minor/major projects, seminars, tutorials.

CO3. To familiarize with recent scientific and technological developments of Properties of matters.

CO4. To Know foundation of research and development in Fluid Mechanics.

CO5. To understand the general structure of atom, spectrum of hydrogen atom.

CO6. To understand the atomic excitation and LASER principles.

CO7. To understand the bonding mechanism and its different types

CO8. To demonstrate an understanding of electromagnetic waves and its spectrum.

CO9. Understand the types and sources of electromagnetic waves and applications.

CO10. To help students to learn various experimental and computational tools thereby developing analytical abilities to address real world problems related to physics.

CO11. To train students in skills related to research, education, industry, and market of physics.

CO12. To help students to build-up a progressive and successful career in Physics.

1121 Algebra and 1122 Calculus-I

After Completion this course the student will be able to:

CO1. Give the students a sufficient knowledge of fundamental principles, methods and a clear perception of in numerous power of mathematical ideas and tools and know how to use them by modelling, solving and interpreting.

CO2. Enhancing students' overall development and to equip them with mathematical modelling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment.

1151-Animal diversity -I and 1152- Animal Ecology

After Completion this course the student will be able to:

CO1. Know taxonomy, systematic, Linnaean system of classification, concept of species, binomial nomenclature.

CO2. Identify animal interaction.

CO3. Understand silent feature of phylum protozoa, classification of phylum Protozoa, type study and economic importance.

CO4. Explains general character of kingdom Animalia, phylum Cnidaria and phylum Platyhelminthes.

CO5. Explains about ecology and ecosystem their types, structure and composition.

CO6. Classify about food chain food web and concept of Eutrophication.

CO7. Create awareness about characteristics of population and Community, understand Exponential and Logistic growth.

CO8. Aware about the population regulation density-dependent and independent factor, the competition and Beneficial Associations.

SECOND SEMESTER

1110 - Education for development in the 21st century

After Completion this course the student will be able to:

- CO1. Demonstrate knowledge and understanding of the principles of music learning.
- CO 2. Develop awareness of current practices of music teaching and learning in a variety of educational settings.
- CO 3. Develop an ability to advocate for the role of music education in society.
- CO 4. Understand the importance of singing in music education and display knowledge of how to engage students of a range of ages in vocal activities.
- CO 5. Develop awareness of teaching and learning styles best suited to engage young children and adolescents in music.

.1111-Inorganic Chemistry and 1112- Analytical Chemistry.

After Completion this course the student will be able to:

- CO1. Apply non-bonded lone pairs in shape of molecule.
- CO2. Illustrate analytical problems and stoichiometric calculation .
- CO3. Elemental analysis -Detection of nitrogen, sulphur, halogen and phosphorous by Lassaigne's test.
- CO4. Explain rules for filling electrons in various orbitals- Aufbau's principle, Pauli exclusion principle, Hund's rule of maximum multiplicity.
- CO5. Define various types of chemical bonds- Ionic, covalent, coordinate and metallic bond.
- CO6. Understand the classification of elements as main group, transition and inner transition elements.

1141-Plant Life and Utilization and 1142-Principals of plant science

After Completion this course the student will be able to:

- CO1. Know scope and importance of plant physiology.
Explains basic of plant life, reproduction and their survival in nature
- CO2. Understand ultra-structure of cell wall, plasma membrane and cell organelles.

CO3. Impart an insight into the internal structure and reproduction of the most evolved group of plants, the angiosperms.

CO4. Identify the role of anatomy in solving the taxonomic and phylogenetic problems.

CO5. To create awareness about cultivation, conservation and sustainable utilization of biodiversity.

1131- Heat and Thermodynamic and 1132-Electricity and Magnetism.

After Completion this course the student will be able to:

CO1. Provide in-depth knowledge of fundamental thermodynamics.

CO2. To enrich knowledge of basic thermodynamics law such as zeroth, Thermodynamic, Electricity and Magnetism first and second law of thermodynamics.

CO3. To familiarize with recent scientific and technological developments of heat transfer mechanism.

CO4. To understand the general process of thermodynamics.

CO5. To understand the heat engine and its efficiency.

CO6. To understand the concept of the electric force, electric field and electric potential for stationary charges

CO7. To understand the dielectric phenomenon and effect of electric field on dielectric.

CO8. To Study magnetic field for steady currents using Biot-Savart and Ampere & Circuit laws

CO9. To study magnetic materials and its properties.

1121-Analytical Geometry and 1122-Calculus – II

After Completion this course the student will be able to:

CO1. Conventions such as notations, terminology and recognize basic geometrical figures and graphical displays, state important facts resulting from their studies.

CO2. Get adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences

CO3. Apply their skills and knowledge, that is, translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process information and draw the relevant conclusion.

1151-Animal diversity and 1152-cell biology

After Completion this course the student will be able to:

- CO1.Know about phylum Aschelminthes, Arthropods, Mollusca.
- CO2.Understand the Animal diversity around us.
- CO3.Understand the compare between prokaryotic and eukaryotics.
- CO4.Understand about cell and component of cell like mitochondria, plasma membrane, nucleus, etc. • Illustrate about function of cell organells.
- CO5Explain about structure of cell organelles, stains and dye.
- CO6.Prepare about cell division.
- CO7.Draw silent feature of phylum arthropods, Mollusca, etc.
- CO8.Understand the underlying principles of classification of different Phylum
- CO9Understand the terminology needed in classification.
- CO10Understand the differences and similarities in the various aspects of classification.
- CO11.Classify invertebrates.

THIRD SEMESTER

2101-PSYCHOLOGY OF THE LEARNER AND LEARNING

After Completion this course the student will be able to:

- CO1. understand the growth and development of the learner and its importance in the learning process with special reference to adolescent stage.
- CO 2. become aware regarding the individual differences among learners
- CO 3. identify the educational needs of diverse learners.
- CO 4. get acquainted with the new (contemporary) theories of learning.
- CO 5. become acquainted with the social aspects of behaviour
- CO 6. deal with behavioural and social problems of the learner
- CO 7. become familiar with the concepts of adjustment, stress management and self concept.
- CO 8. find co relation between adjustment, stress management and self-concept and classroom behaviour.

2112-Organic and 2111-Analytical Chemistry

After Completion this course the student will be able to:

- CO1. Define different terms in column chromatography
- CO2. Explain Kohlrausch's law and its Applications.
- CO03. Explain / derive Beer's law of absorptivity.
- CO4. Explain thermodynamic aspects of Ideal solution
- CO5. Differentiate between ideal and non-ideal solutions
- CO6. Explain synthesis of carboxylic acid.
- CO7. Identify the structures aldehydes and ketones from their names.
- CO8. Apply solvent extraction to separate the components of from mixture interest.
- CO9. Draw the structures of different conformations of cyclohexane.

2141-Taxonomy of Angiosperms and 2142-Plant Physiology.

After Completion this course the student will be able to:

- CO1. Know concept of kinetics, terms used, rate laws, molecularity, Physical and Inorganic Chemistry order.
- CO2. Know Determination of order of reaction by integrated rate equation method, graphical method, half-life method and differential method.
- CO3. Define different terms related to the coordination chemistry
- CO4. Explain principle of CFT.
- CO5. Explain derive integrated rate laws, characteristics, expression for half-life and examples of zero order, first order, and second order reactions.
- CO6. Solve the problem based applying theory and equations.
- CO7. Draw the structures aromatic hydrocarbons from their names or from structure name can be assigned.
- CO8. Apply adsorption process to real life problem.
- CO9. Apply principles of VBT to explain bonding in coordination compound of different geometries.

2131-Mathematical methods in physics and 2132-Electronics

After Completion this course the student will be able to:

- CO1.To know importance of mathematics in physics.
- CO2.Know Complex algebra to solve physics complex problem
- CO3.Understand the complex algebra useful in physics courses
- CO4.Understand the concept of partial differentiation.
- CO5.Understand the role of partial differential equations in physics
- CO6.Understand vector algebra useful in mathematics and physics
- CO7.Understand the relations in electricity
- CO8.Understand the properties and working of transistors.
- CO9.Understand the functions of operational amplifiers.
- CO10.Understand the Boolean algebra and logic circuits.
- CO11.Design circuits using transistors and operational amplifiers.
- CO12.Apply laws of electrical circuits to different circuits.

2121-Mathematics Calculus of Several Variables and 2122-Numerical Methods

After Completion this course the student will be able to:

- CO1. Recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognize basic geometrical figures and graphical displays, state important facts resulting from their studies.
- CO2.Get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.
- CO3.Adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences.
- CO4.Apply their skills and knowledge, that is, translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.
- CO5.Made aware of history of mathematics and hence of its past, present and future role as part of our culture.

2151- Animal Diversity –III & 2152-Applied Zoology.

After Completion this course the student will be able to:

- CO1.Identify the diversity of higher vertebrates.
- CO2.Understand classification higher vertebrates.

- CO3. Understand the complexity of higher vertebrates
- CO4. Understand different life functions of higher vertebrates.
- CO5. Understand the linkage among different groups of higher vertebrates.
- CO6. Understands the basics about beekeeping tools, equipment, and managing beehives.
- CO7. Understands the biology, varieties of silkworms and the basic techniques of silk production.
- CO8. Understands the types of agricultural pests, Major insect pests of agricultural importance and Pest control practices.
- CO9. Become aware regarding his role and responsibility towards nature as a protector,
- CO10. Understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life.

FOURTH SEMESTER

(2101)-PSYCHOLOGY OF THE LEARNER AND LEARNING

After Completion this course the student will be able to:

- CO1. understand the growth and development of the learner and its importance in the learning process with special reference to adolescent stage.
- CO 2. become aware regarding the individual differences among learners
- CO 3. identify the educational needs of diverse learners.
- CO 4. get acquainted with the new (contemporary) theories of learning.
- CO 5. become acquainted with the social aspects of behaviour
- CO 6. deal with behavioural and social problems of the learner
- CO 7. become familiar with the concepts of adjustment, stress management and self concept.
- CO 8. find co relation between adjustment, stress management and self-concept and classroom behaviour.

2111- Physical and Analytical Chemistry, 2112- Inorganic and Organic Chemistry.

After Completion this course the student will be able to:

- CO1. Define different terms in column chromatography

- CO2.Explain Kohlrausch's law and its Applications.
- CO3.Explain / derive Beer's law of absorptivity.
- CO4.Explain thermodynamic aspects of Ideal solution
- CO5.Differentiate between ideal and non-ideal solutions
- CO6.Explain synthesis of carboxylic acid.
- CO7.Identify the structures aldehydes and ketones from their names.
- CO8.Apply solvent extraction to separate the components of from mixture interest.
- CO9.Draw the structures of different conformations of cyclohexane.

(2141)- Plant Anatomy and (2142)-Plant Biotechnology

After Completion this course the student will be able to:

- CO1.Understand the biochemical nature of nucleic acid and their role in living systems.
- CO2.Understand the fundamental of recombinant DNA technology
- CO3.Understand tissue culture techniques.
- CO4.Understand the concept of bioinformatics, genomics & proteomics.
- CO5.Understand mechanical tissue system, epidermal tissue system
- CO6.Understand mega sporangium and female gametophyte

2131-Oscillation, wave and sound, 2132- Optics

After Completion this course the student will be able to:

- CO1.To Know how light can constructively and destructively interfere Oscillation, waves, sound, and optics
- CO2.To define the decibel scale qualitatively, and give examples of sounds at various levels.
- CO3.Describe oscillatory motion with graphs and equations, and use these descriptions to solve problems of oscillatory motion.
- CO4.Explain oscillation in terms of energy exchange, giving various examples.
- CO5.Explain the Doppler Effect, and predict in qualitative terms the frequency change that will occur for a stationary and a moving observer. Understand the role of partial differential equations in physics

CO6.Explain in qualitative terms how frequency, amplitude, and wave shape affect the pitch, intensity, and quality of tones produced by musical instruments understand the properties and working of transistors.

CO7.Explain in qualitative terms how frequency, amplitude, and wave shape affect the pitch, intensity, and quality of tones produced by musical instruments

CO8Understand the mathematical description of travelling and standing waves

CO9.To analyse simple examples of interference and diffraction phenomena.

2121- Linear Algebra & 2122-Vector Calculus

After Completion this course the student will be able to:

CO1.Know linear algebra regarding eigen values of various types of linear operators and their possible canonical forms along with linear functional, bilinear forms and inner products.

CO2.Have knowledge of central concepts in multivariable analysis, including space curves; directional derivative; gradient; multiple integrals; line and surface integrals; vector fields; divergence, curl and flux; the theorems of Green and Stokes, and the divergence theorem.

CO3.Apply techniques from multivariable analysis to set up and solve mathematical models, to deduce simple mathematical results, and to calculate integrals.

CO4.Set up and solve simple optimization problems, including problems with constraints. ZO-

2151- Animal systematic & Diversity IV - 2152-Applied Zoology II

After Completion this course the student will be able to:

CO1.Know silent feature of class Reptile, Aves and Mammalia.

CO2.Explains apiculture and Fisheries. • Understand life cycle and behaviour of Bee, habit and habitat of freshwater forms

CO3.Classify fishery by-product.

CO4.Create awareness about importance of apiculture and fisheries.

CO5.Draw adaptation in Reptiles, Migration in birds, etc.

FIFTH SEMESTER

3102 -Quality & Management of School Education: Issues & Concern

After Completion this course the student will be able to:

- CO1. Understand the concept of quality
- CO2. Enlist the dimensions of quality
- CO3. Understand the concept of Management.
- CO4. Acquire knowledge regarding the concept and process of Human Resource Management in School.
- CO5. Get acquainted with the essential infrastructural resources for quality management.
- CO6. Identify the problems and its management in Secondary Education.
- CO7. Recognize Management and Administrative set up in education.

3111-Physical I Chemistry

After Completion this course the student will be able to:

- CO1. Know historical of development of quantum mechanics in chemistry.
- CO2. Know Photochemical reactions: photosynthesis, photolysis, photocatalysis, photosensitization
- CO3. Understand the differences between classical and quantum mechanics.
- CO4. Understand the term additive and constitutive properties.
- CO5. Understanding of De Broglie hypothesis and the uncertainty principle.
- CO6. Explain the difference between Rayleigh, Stokes and anti-Stokes lines in a Raman spectrum.
- CO7. Explain photochemical phenomena like fluorescence and phosphorescence, Chemiluminescence. • Solve Schrodinger equation for 1D, 2D and 3D model.
- CO8. Draw the Stokes and anti-Stokes lines in a Raman spectrum.

3131-

Mathematica Methods in Physics

After Completion this course the student will be able to:

CO1: The three commonly used co-ordinate systems and general curvilinear co-ordinate system.

CO2: Concept of relativity, length contraction, relativistic mass, time dilation and twin paradox.

CO3: Various methods to solve different differential equations.

CO4: Properties of Legendre polynomials, Hermite polynomials and Bessel function. These are useful to solve the problem of linear simple harmonic oscillator in quantum mechanics.

3121- Matric space

After Completion this course the student will be able to:

CO1. To develop the mathematical maturity of students in their current and future courses

CO2.To develop students' theoretical, applied and computational skills.

CO3.To gain confidence in student in proving theorems and solving problems.

3123-Group Theory

After Completion this course the student will be able to:

CO1.Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc;

CO2.Analyze consequences of Lagrange's theorem

CO3.learn about structure preserving maps between groups and their consequences.

CO4.explain the significance of the notion of cosets, normal subgroups, and factor groups.

3152-Histology

After Completion this course the student will be able to:

CO1.Identify type of tissues.

CO2.Label diagram (V.S & T.S) of tissue.

CO3.Understand the histological aspects of mammalian organs.

CO4.Explain the important features of different types of tissues in organ system.

CO5.Understand the classification of various types of basic tissues.

CO6.Describe structure & functions of various tissues in organ system.

CO7.Illustrate histological structure of various glands and its functions.

3133-Classical Mechanics

After Completion this course the student will be able to:

CO1.To demonstrate knowledge and understanding of the following fundamental concepts

CO2.The dynamics of system of particles,

CO3.motion of rigid body,

CO4.Lagrangian and Hamiltonian formulation of mechanics

CO5.To represent the equations of motion for complicated mechanical systems using the Lagrangian and Hamiltonian formulation of classical mechanics.

CO6.To develop math skills as applied to physics.

3124-Ordinary Differential Equations

After Completion this course the student will be able to:

CO1.Understand the genesis of ordinary differential equations.

CO2.learn various techniques of getting exact solutions of solvable first order differential equations and linear differential equations of higher order.

CO3.Grasp the concept of a general solution of a linear differential equation of an arbitrary order and also learn a few methods to obtain the general solution of such equations.

3153-Biological Chemistry

After Completion this course the student will be able to:

CO1.Define the basic concepts and significance of biochemistry.

CO2.Understand the basic concepts pH and Buffers

CO3.Explain chemical structures of carbohydrate, and their biological and clinical significance.

CO4.Describe structure and importance of proteins and lipids

CO5.Discuss the variations in enzyme activity and kinetics

CO6.Relate activity of enzyme at different pH.

CO7.Interpret structure and importance of proteins, carbohydrates and lipids.

3101-Compulsory English

After Completion this course the student will be able to:

CO1.To familiarize to enable students to become competent and effective users of English in real life situations.

CO2.To contribute to the overall personality development of the students.

CO3.To instil humanitarian values and foster sympathetic attitude in the students.

CO4.To train the students in practical writing skills required in work environment.

CO5. To impart knowledge of some essential soft skills to enhance their employability.

3132-Electrodynamics

After Completion this course the student will be able to:

CO1.To introduce the basic mathematical concepts related to electromagnetic vector fields.

CO2.To impart knowledge on the concepts of electrostatics, electric potential, energy density and their applications.

CO3.To impart knowledge on the concepts of magnetostatics, magnetic flux density, scalar and vector potential and its applications.

CO4.To impart knowledge on the concepts of Faraday's law, induced emf and Maxwell's equations.

CO5To impart knowledge on the concepts of Concepts of electromagnetic waves and Transmission lines.

3154- Genetics

After Completion this course the student will be able to:

CO1. To understand the basic concepts and significance of Genetics.

CO2. To understand the basic concepts of genes Classical and Modern concept of Gene.

CO3. To understand Exceptions to Mendelian Inheritance, and their significance.

CO4. To understand the concept of Gene Mutation

CO5. To understand the Sex-determination & Basic Concepts in Human population genetics.

CO6. To understand various Genetic disorders & Application of genetics.

(3104)-Mathematics Education

After Completion this course the student will be able to:

CO 1. Understand the nature, scope and importance of the subject.

CO 2. State the objectives of the subject.

CO 3. Understand qualities of good teacher.

3103-Science Education

After Completion this course the student will be able to:

CO1. Understand the concept of Teaching Science Subject.

CO2. Comprehend the types, method, tools, and techniques of Science Teaching.

CO3. Develop a scientific outlook towards the problems of education system through Science.

CO4. Realize the educational problems and to try and find solutions through Scientific Attitude.

CO5. Use of scientific outlook and other sources of knowledge for teaching science.

3133-Thermodynamics and Statistical Physics

After Completion this course the student will be able to:

CO1.To know importance of thermodynamics.

CO2.Understand the concept of statistics.

CO3.Understand the concept of partial differentiation.

CO4.Understand the various derivations of Maxwell relations.

CO5.Understand the concept of quantum statistics.

CO6.Apply laws of thermodynamics for various applications.

3112-Inorganic I Chemistry

After Completion this course the student will be able to:

- CO1.Know electronic configuration of lanthanides and actinides.
- CO2.Know Intrinsic and extrinsic semiconductor.
- CO3.Know the meaning of term f-block elements, Inner transition elements, lanthanides, actinides.
- CO4.Explain MOT of Octahedral complexes with sigma bonding.
- CO5.Explain the meaning of metal & semiconductor.
- CO6.Explain electro neutrality principle and different types of pi bonding.
- CO7.Understand classification of reactions of coordination compounds
- CO8.Understand Stereochemistry of mechanism
- CO9.Draw n (E) & N (E) curves.

3134-Atomic and Molecular Physics

After Completion this course the student will be able to:

- CO1.To describe the atomic spectra of one and two valance electron atoms.
- CO2.To Describe electron spin and nuclear magnetic resonance spectroscopy and their applications.
- CO3.To explain the change in behaviour of atoms in external applied electric and magnetic field.
- CO4.To explain rotational, vibrational, electronic and Raman spectra of molecules.

3151-Pest Management

After Completion this course the student will be able to:

- CO1.Define pest and type of pest.
- CO2.Explain why identification of the pest is the first step in developing an effective Pest control strategy.
- CO3.Explain the differences between continuous pests, sporadic pests, and potential pests.

CO4.Explain what is meant by prevention, suppression, and eradication of pests.

CO5.Describe "thresholds" and why they are an important consideration in developing a pest control strategy.

CO6.3Describe "monitoring" as it relates to pest control and explain why it is important to pest control strategy.

3122-Real Analysis I

After Completion this course the student will be able to:

CO1.learn the basic facts in logic and set theory

CO2.learn to define sequence in terms of functions from \mathbb{N} to a subset of \mathbb{R} and to understand several properties of the real line.

CO3.recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.

CO4.use the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.

3133-Analytical I Chemistry

After Completion this course the student will be able to:

CO1.Identify important parameters in analytical processes or estimations.

CO2.Explain different principles involved in the gravimetric, spectrophotometry, parameters in instrumental analysis, qualitative analysis.

CO3Discuss procedure for different types analyses included in the syllabus.

CO4.Compare among the different analytical terms, process and analytical methods.

CO5.Demonstrate theoretical principles with help of practical.

CO6.Design analytical procedure for given sample.

CO7.Apply whatever theoretical principles he has studied in theory during practical session in laboratory.

3114-Industrial Chemistry

After Completion this course the student will be able to:

CO1.Know the physico-chemical principals involved in manufacturing process.

CO2.Know the concept of basic chemicals their uses and manufacturing process.

- CO3.Understand classification and general properties of pigment.
- CO4.Understand the important of Sugar industry, Fermentation industry, Soap industry.
- CO5.Understand production processes of zinc oxide and iron oxide.
- CO6.Explain the synthesis of chemical reactions of polynuclear and hetreonuclear aromatic Hydrocarbons.
- CO7.Explain washing action of soap and detergents.
- CO8.Explain synthesis, Structures, properties and applications of dyes.

SIXTH SEMESTER

3102 -Quality & Management of School Education: Issues & Concern

After Completion this course the student will be able to:

- CO1.Understand the concept of quality
- CO2.Enlist the dimensions of quality
- CO3.Understand the concept of Management.
- CO4. Acquire knowledge regarding the concept and process of Human Resource Management in School.
- CO5. Get acquainted with the essential infrastructural resources for quality management.
- CO6. Identify the problems and its management in Secondary Education.
- CO7. Recognize Management and Administrative set up in education.

3101-Compulsory English

After Completion this course the student will be able to:

- CO1.To familiarize to enable students to become competent and effective users of English in real life situations.
- CO2.To contribute to the overall personality development of the students.
- CO3.To instill humanitarian values and foster sympathetic attitude in the students.
- CO4.To train the students in practical writing skills required in work environment.
- CO To impart knowledge of some essential soft skills to enhance their employability.

(3134)- Nuclear Physics

After Completion this course the student will be able to:

CO1: Studying Basic properties of nucleus, student got the idea of inner information of the nucleus.

CO2: From radioactivity chapter student knew that which radiations emit from radioactive

material and how they are useful and harmful for the human.

CO3: From nuclear force student understood that apart from alpha, beta, gamma particle how

many other particles are inside the nucleus.

CO4: Studying molecular spectroscopy students understand the importance rotational and

vibrational energy levels.

CO5: Student learnt by using accelerators we can produce high energy particle which can be

used for research purpose

CO6: Use of nuclear reactors to produce huge amount of heat energy.

(3151)-Medical & Forensic Zoology

After Completion this course the student will be able to:

CO1. To understand the scope, need and History of Forensic Science.

CO2. To understand the role of different institutes & allied institutes of Forensic Science.

CO3. To understand the various branches of Forensic Sciences from Life Sciences.

CO4. To understand human physiology, post mortal investigations.

CO5. To understand knowledge of handling different types of evidences and their examinations.

3123-Ring Theory

After Completion this course the student will be able to:

CO 1. Gain sound knowledge on fundamental principles and concepts of Mathematics and computing with their applications related to Industrial, Engineering, Biological and Ecological problems.

CO 2. Get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.

CO 3. Enhancing student's overall development and to equip them with mathematical modelling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment.

(3104)-Mathematics Education

After Completion this course the student will be able to:

CO 1. Understand the nature, scope and importance of the subject.

CO 2. State the objectives of the subject.

CO 3. Understand qualities of good teacher.

3103-Science Education

After Completion this course the student will be able to:

CO1. Understand the concept of Teaching Science Subject.

CO2. Comprehend the types, method, tools, and techniques of Science Teaching.

CO3. Develop a scientific outlook towards the problems of education system through Science.

CO4. Realize the educational problems and to try and find solutions through Scientific Attitude.

CO5. Use of scientific outlook and other sources of knowledge for teaching science.

3133 - Thermodynamics and Statistical Physics

After Completion this course the student will be able to:

CO1: To study the transport phenomenon such as viscosity, thermal conductivity, diffusion.

CO2: To learn about thermodynamic functions, variables and their relations.

CO3: To acquire the skill of solving problems based of particle distribution.

CO4: To study about types of ensembles viz. Microcanonical, canonical and grand canonical.

CO5: To get the knowledge about Maxwell Boltzmann statistics, Bose Einstein statistics and

Fermi Dirac Statistics.

3152-Physiology

After Completion this course the student will be able to:

CO1.Know scope of Physiology.

CO2.Draw nutrition and energy requirement.

CO3.Identify physiology and endocrinology of Reproductive System.

CO4.Explain about nervous system, origin and conduction of nerve impulse, synapse, ultra structure and transmission of Nerve impulse, etc.

CO5.Describes physiology and endocrinology of alimentary canal.

CO6.Understand respiration, organ involve in respiration and mechanism of respiration, transport of oxygen and carbon dioxide, respiratory Quotient and BMR.

CO7.Understand about physiology of excretion role of ADH and Renin Angiotensin , and clinical significance of renal failure, renal calculi,etc.

3124- Partial Differential Equations

After Completion this course the student will be able to:

CO1.Formulate, classify and transform partial differential equations into canonical form.

CO2.Solve linear partial differential equations using various methods and apply these methods in solving some physical problems.

CO3.Illustrate about circulation by cardiac cycle, systole and diastole blood pressure, etc.

CO4.Prepare ultra-structure of striated Muscle and response of muscle to stimulation, response of muscle to stimulation, etc.

CO5.Illustrate Electrocardiogram, color Doppler, etc

3113-Physical III Chemistry

After Completion this course the student will be able to:

CO1.Know meaning of the terms-Solution, electrolytes, nonelectrolytes and colligative properties.

CO2.Understand freezing point depression, Beckmann's method Osmosis and Osmotic pressure, Berkeley and Hartley method,

CO3.Understand Conductors and insulators – Its correlation with Extent of energy in energy bands

CO4.Understand Semiconductors – Role of impurity in transformation of insulator into semiconductor.

CO5.Explain phenomena of photoconductivity

CO6.Explain relation between Vant Hoff's factor and degree of dissociation of electrolyte by colligative property.

CO7.Explain classification of polymers and chemical bonding & Molecular forces in Polymer

CO8.Apply the colligative properties to determine molecular weight of nonelectrolyte, abnormal molecular weight.

3112- Inorganic II Chemistry

After Completion this course the student will be able to:

CO1.Understand the retrosynthesis and synthesis of target molecules.

CO2.Understand different terms used – Disconnection, Synthons, Synthetic equivalence, FGI, TM.

CO3. Understand Wolff rearrangement (Step up), Hofmann rearrangement, Simmons-Smith reaction, Michael reaction, Wittig reaction.

CO4. Understand the retrosynthesis of Acetophenone, Crotonaldehyde, Cyclohexene, Benzylbenzoate, and Benzyl diethyl malonate.

CO5. Understand Ephedrine- structure determination using chemical methods.

CO6. Explain the chemistry of reactive intermediates.

CO7. Explain the synthesis of Citral by Barbier and Bouveault Synthesis.

CO8. Draw functional group interconversions and structural problems using chemical reactions.

(3123) Complex analysis

After Completion this course the student will be able to:

CO1. To develop the mathematical maturity of students in their current and future courses

CO2. To develop students' theoretical, applied and computational skills.

CO3. To gain confidence in student in proving theorems and solving problems.

(3132) Quantum mechanics

After Completion this course the student will be able to:

CO1: Introduction to Quantum Mechanics, Historical background, Matter Waves, Wave particle

duality, Phase and Group Velocity, Heisenberg's Uncertainty Principle

CO2: Physical Interpretation of Wave function, Schrödinger's Wave Equation, Eigen Function

and Eigen values

CO3: Free Particle, One Dimensional and Three Dimensional Rigid Box, Potential Barrier

CO5: Understand Scattering theory and its importance

CO6: Understand Relativistic wave equations, Klein Gordon equations and Dirac's relativistic equations.

3131 - Solid State Physics

After Completion this course the student will be able to:

CO1: Students will be able to study difference between crystalline and amorphous material, crystal structures, miller indices, interplaner distances, interatomic forces and bond. From this study students get to learn the basics of solid state physics.

CO2: Students will understand Bragg's diffraction, Bragg's law. X-ray diffraction and characterization techniques. With the help of this knowledge students know the principles of structures determination by X-ray diffraction method. This would be helpful in performing experiments in nanotechnology.

CO3: Students can understand electrical and thermal conductivity of free electron in metals, Energy levels of free electrons in one and three dimensions.

They will learn significance of Pauli's exclusion principle, Bloch theorem, Fermi energy, and Hall effect and energy bands in materials.

CO4: Students can Describe and explain the behaviour of permanent magnet including induced magnetism, behaviour of paramagnetic, diamagnetic, ferromagnetic materials in terms of magnetic domain.

CO5: Students can understand superconducting materials, their properties and technological applications of superconductivity.

3154-Entomology

After Completion this course the student will be able to:

CO1. To understand the scope of Entomology and general characters of Insects.

CO2. To study the morphology and anatomy of Insects.

CO3. To learn the concept of social organization in Insects.

CO4. To understand metamorphosis in Insects.

CO5. To study the economically important insects and Pest management of harmful insects

3153-Molecular Biology

After Completion this course the student will be able to:

- CO1.Know Interdisciplinary nature of Cell Biology.
- CO2.Know Morphology and ultrastructure of nucleus.
- CO3.Know about Cell signaling
- CO4.Understand Ultrastructure, components and functions of Cell organelles.
- CO5.Explore more about Chromosomes.

3122-Real Analysis

After Completion this course the student will be able to:

- CO1.earn the basic facts in logic and set theory
- CO2.learn to define sequence in terms of functions from \mathbb{N} to a subset of \mathbb{R} and to understand several properties of the real line.
- CO3.recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.
- CO4.use the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.

3111-Physical I Chemistry

After Completion this course the student will be able to:

- CO1.Know historical of development of quantum mechanics in chemistry.
- CO2.Know Photochemical reactions: photosynthesis, photolysis, photocatalysis, photosensitization
- CO3.Understand the differences between classical and quantum mechanics.
- CO4.Understand the term additive and constitutive properties.
- CO5.Understanding of De Broglie hypothesis and the uncertainty principle.
- CO6.Explain the difference between Rayleigh, Stokes and anti-Stokes lines in a Raman spectrum.
- CO7.Explain photochemical phenomena like fluorescence and phosphorescence, Chemiluminescence.
- CO8.Solve Schrodinger equation for 1D, 2D and 3D model.
- CO9.Draw the Stokes and anti-Stokes lines in a Raman spectrum.

3114-Inorganic III Chemistry

After Completion this course the student will be able to:

- CO1. Know the abundance of elements in living system and earth crust.
- CO2. Know the metalloproteins of iron
- CO3. Understand the structure and bonding using valence electron count (18 ele. rule).
- CO4. Understand the catalytic reactions used in industries around.
- CO5. Understand M-C bond and to define organometallic compounds
- CO6. Understand the principle of heterogeneous catalyst.
- CO7. Explain the essential properties of homogeneous catalysts
- CO8. Identify the biological role of inorganic ions & compounds.

SEVENTH SEMESTER

4102-Introduction to Educational Research

After Completion this course the student will be able to:

- CO1. Explain the concept, need and importance of Research.
- CO2. Identify various methods of types of research.
- CO3. Realize the research problem and try to find solutions through research.
- CO4. Use the library, on line sources & other sources of knowledge for educational research.
- CO5. Prepare tools & techniques of educational research.

4103-Advanced Pedagogy and Teaching

After Completion this course the student will be able to:

- CO1. Explain the concept of Advanced Pedagogy and its implementation in classroom
- CO2. use of Pedagogical methods to meet the needs of diverse learners in the classroom.

CO3. Familiarize with the concept, need and importance of ICT and its application in education

CO4. Identify ICT based teaching-learning strategies & resources.

CO 5. create awareness about appropriate use of ICT in teaching - leaning process.

CO6. develop educational material using advanced pedagogical strategies and ICT tools independently.

4104-Advanced Evaluation procedures in learning

After Completion this course the student will be able to:

CO1) Identify the difference between measurement, assessment and evaluation.

CO2) Acquires knowledge about tools and techniques of evaluation for learning.

CO3) Develops skill for preparing administering and interpreting the achievement test.

CO4) Comprehends the process of assessment for teaching learning.

CO5) Develops skills necessary to compute basic statistical measures to assess the learning.

4105 -Instructional Design and Integration of ICT in Teaching Learning

After Completion this course the student will be able to:

CO1. understand the concept of Advanced Pedagogy and its implementation in classroom

CO2. use of Pedagogical methods to meet the needs of diverse learners.

CO3. understand the concept, need and importance of ICT and its application in education

CO4. understand ICT based teaching-learning strategies & resources.

CO5. create awareness about appropriate use of ICT

CO6. develop educational material using advanced pedagogical strategies and ICT tools.

4101-Introduction to Guidance and Counselling In School

After Completion this course the student will be able to:

- CO1. Understand the concept, need and meaning of guidance.
- CO2. Get acquainted with the principles, issues, problems and procedure of guidance.
- CO3. Develop understanding about the role of school in guidance.
- CO4. Understand the various areas, tools and techniques in guidance.
- CO5. Understand the concept, need and meaning of counselling.
- CO6. Get acquainted with the principles and process of counselling.
- CO7. Realize the qualities and role of a school counsellor.
- CO8. Understand the tools and techniques in counselling.
- CO9. Realize the importance of follow-up in counselling.
- CO10. Realize the need of counselling for children with special needs.

4111-Organic chemistry

After Completion this course the student will be able to:

- CO1 To understand basic concept of Organic chemistry.
- CO2 To prepare background for advanced and applied studies in chemistry
- CO3 The students are expected to understand the fundamentals, principles, and recent developments in the subject area.
- CO4 It is expected to inspire and boost interest of the students towards chemistry as them in subject.

4131-Computational Physics

After Completion this course the student will be able to:

- CO1.To define types of programming languages and their uses.
- CO2.To define operators and expression in C-programming and navigate c commands.
- CO3.To explain control statements and loops as well as capable of writing C-program to solve problems.
- CO4.To describe arrays and pointers and apply them in C program.

CO5.To implement numerical algorithms into C-program and visualize the results of the computations.

CO6.To present different numerical methods to solve different types of physical and technical problems.

4151: Parasitology

After Completion this course the student will be able to:

CO1.To understand the basic terminologies in parasitology.

CO2.To understand the concepts of animal association with examples.

CO3. To understand the morphology and life cycle of common parasites (Protists and Platyhelminthes).

CO4. To understand the phenomenon of Host-parasite relationship.

CO5. Explain the importance of arthropod vectors with examples

4112-Biomolecules

After Completion this course the student will be able to:

CO1.To understand basic concept of physical, Organic and Inorganic chemistry

CO2.To prepare background for advanced and applied studies in chemistry

CO3.The students are expected to understand the fundamentals, principles, and recent developments in the subject area.

CO4.It is expected to inspire and boost interest of the students towards chemistry as them in Subject.

4132- Astronomy and Astrophysics

After Completion this course the student will be able to:

CO1.Acquire knowledge of the Physical universe and its evolution.

CO2.Define and use fundamental principles and techniques of astronomy and astrophysics.

CO3.Understand and apply basic physics and computational techniques to solve problems in astrophysics, and interpret the results.

CO4.Familiarize with the basic principles and theories of new emerging area of astrophysics and astrobiology.

CO5. Attain the knowledge of evolution, classification, formation of, stars, planets, satellites, and theory of interstellar medium.

CO6. Familiarize with the structure and population of the Milky Way galaxy, properties of galaxies and its classifications.

CO7. Demonstrate the ability to link observation and theory.

CO8. Learn theoretical and practical aspects of modern observational astronomy. Photometry, spectroscopy, stellar classification, detectors, and basic information of telescopes.

4152-Developmental Biology

After Completion this course the student will be able to:

CO1. Know definition and scope of Developmental biology.

CO2. Know theories of Developmental biology.

CO3. Explain concepts in Developmental biology.

CO4. Understand Gametogenesis and its structure.

CO5. Explain Cleavage and Blastula.

CO6. Describe basic cell movements in gastrulation and concept of organizer.

CO7. Describe chick embryology.

EIGHT SEMESTER

4102-Introduction to Educational Research

After Completion this course the student will be able to:

CO1. Explain the concept, need and importance of Research.

CO2. Identify various methods of types of research.

CO3. Realize the research problem and try to find solutions through research.

CO4. Use the library, on line sources & other sources of knowledge for educational research.

CO5. Prepare tools & techniques of educational research.

4103-Advanced Pedagogy and Teaching

After Completion this course the student will be able to:

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CO2. use of Pedagogical methods to meet the needs of diverse learners in the classroom.

CO3. Familiarize with the concept, need and importance of ICT and its application in education

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CO5. create awareness about appropriate use of ICT in teaching - leaning process.

CO6. develop educational material using advanced pedagogical strategies and ICT tools independently.

4104-Advanced Evaluation procedures in learning

After Completion this course the student will be able to:

CO1. Identify the difference between measurement, assessment and evaluation.

CO2. Acquires knowledge about tools and techniques of evaluation for learning.

CO3. Develops skill for preparing administering and interpreting the achievement test.

CO4. Comprehends the process of assessment for teaching learning.

CO5. Develops skills necessary to compute basic statistical measures to assess the learning.

4105 -Instructional Design and Integration of ICT in Teaching Learning

After Completion this course the student will be able to:

CO1. understand the concept of Advanced Pedagogy and its implementation in classroom

CO2. use of Pedagogical methods to meet the needs of diverse learners.

CO3. understand the concept, need and importance of ICT and its application in education

CO 4. understand ICT based teaching-learning strategies & resources.

CO 5. create awareness about appropriate use of ICT

CO6. develop educational material using advanced pedagogical strategies and ICT tools.

4111-Organic chemistry

After Completion this course the student will be able to:

- CO1 To understand basic concept of Organic chemistry.
- CO2 To prepare background for advanced and applied studies in chemistry
- CO3 The students are expected to understand the fundamentals, principles, and recent developments in the subject area.
- CO4 It is expected to inspire and boost interest of the students towards chemistry as them in subject.

4131-Electronics

After Completion this course the student will be able to:

- CO1.To study different types of semiconductor devices.
- CO2.To study applications of semiconductor devices.
- CO3.To understand the parameters, characteristics and working of JFE1 MOSFET.
- CO4.To applications of operational amplifiers.
- CO5. To study sequential circuits.
- CO6. To study and solve examples using K map.

4151-Evolutionary Biology

After Completion this course the student will be able to:

CO1. Provide comprehensive overview of Concept of Evolution.

CO2. Know adequate knowledge about Micro-evolutionary changes, Speciation and Adaptive Radiation

CO3. Explain Origin of Life especially Prokaryotes as well as Eukaryotes in detail.

CO4. Explore salient features of various theories of evolution comprising of Lamarckism, Darwinism and Neo-Darwinism.

CO5. Impart detailed understanding of Analogy, Homology, Paleontological Evidences, Embryological Evidences and Molecular Phylogeny.

CO6. Understand adequate information about Geological Time Scale and Neutral Theory of Molecular Evolution.

CO7. Illustrate comprehensive knowledge regarding various Sources of Variations and their role in evolution.

CO8. Explain concepts of Population Genetics in terms of Hardy Weinberg Law, Genetic Drift and Types of Natural Selection.

4112- Organic Chemistry III

After Completion this course the student will be able to:

CO1. Understand the retrosynthesis and synthesis of target molecules.

CO2. Understand different terms used – Disconnection, Synthons, Synthetic equivalence, FGI, TM.

CO3. Understand Wolff rearrangement (Step up), Hofmann rearrangement, Simmons-Smith reaction, Michael reaction, Wittig reaction.

CO4. Understand the retrosynthesis of Acetophenone, Crotonaldehyde, Cyclohexene, Benzyl benzoate, and Benzyl diethyl malonate.

CO5. Understand Ephedrine- structure determination using chemical methods.

CO6. Explain the chemistry of reactive intermediates.

CO7. Explain the synthesis of Citral by Barbier and Bouveault Synthesis.

CO8. Draw functional group interconversions and structural problems using chemical reactions.

4132 – Laser

After Completion this course the student will be able to:

CO1.To foster scientific attitude, provide in-depth knowledge of scientific and technological concepts of Physics.

CO2.To enrich knowledge through problem solving, minor/major projects, seminars, tutorials, review of research articles/papers, participation in scientific events, study visits, etc.

CO3.To familiarize with recent scientific and technological developments.

CO4.To create foundation for research and development in Physics.

CO5.To help students to learn various experimental and computational tools thereby developing analytical abilities to address real world problems.

CO6.To train students in skills related to research, education, industry, and market.

CO7.To help students to build-up a progressive and successful career in Physics.

4152-Techniques in Biology

After Completion this course the student will be able to:

CO1.Know the scope of Entomology and general characters of Insects.

CO2.Study the morphology and anatomy of Insects.

CO3.Study the economically important insects and Pest management of harmful insects.

CO4.Learn the concept of social organization in Insects.

CO5.Understand metamorphosis in Insects.

CO6.Understand insect anatomy.

CO7.Describe systems of insect.

CO8.Illustrate insect ecology.

4101-Introduction to Guidance and Counselling In School

After Completion this course the student will be able to:

- CO1. Understand the concept, need and meaning of guidance.
- CO2. Get acquainted with the principles, issues, problems and procedure of guidance.
- CO3. Develop understanding about the role of school in guidance.
- CO4. Understand the various areas, tools and techniques in guidance.
- CO5. Understand the concept, need and meaning of counselling.
- CO6. Get acquainted with the principles and process of counselling.
- CO7. Realize the qualities and role of a school counsellor.
- CO8. Understand the tools and techniques in counselling.
- CO9. Realize the importance of follow-up in counselling.
- CO10. Realize the need of counselling for children with special needs

