

## Criterion II

### 2.6.1 – Program outcomes, program specific outcomes and course outcomes for all programs offered by the institution are stated and displayed in website of the institution

#### Program Outcomes

- To Develop and Promote scientific attitude.
- Holistic development of students.
- Effective communication: speak, read, write and listen clearly in person through electronic media in English and in one Indian language and make meaning of the word by connecting people, ideas, books, media and technology.
- Develop critical thinking.
- Understand the issues of environmental contexts and sustainable development.
- Inculcation of human values.
- Strengthen mathematical and computational skills.
- Enable students to use ICT effectively.
- Develop good skills in laboratory such as observation and evaluation.
- Use of modern tools and technology.
- To generate intelligent and skilful human beings with adequate theoretical and practical knowledge of the various mathematical systems.
- To Inculcate conceptual understanding in basic phenomena, statements, theorems and development of appropriate problem-solving skill suitable for applications and abstract algebra technique, sufficient logical connectivity is provided.

#### Program Specific Outcomes

##### 1.Chemistry

PSO1 – To enrich Knowledge of chemistry and can select, organize scientific

Information from proper source and communicate in logical manner.

PSO2 – Describe the method of chemical investigation.

PSO3 – To enrich Knowledge of use of apparatus, chemicals while performing experiments.

PSO4 – To know the safety about how to carryout experiment.

PSO3 – Understand basics of science and environmental awareness.

PSO4 – Application of chemical To enrich Knowledge to explain observation and solve the problem.

PSO5 – Understand chemical facts and principals.

## **Course Outcome**

### **Chemistry**

#### **B.Sc. I Year**

#### **Semester-I**

#### **Paper I Physical Chemistry**

CO 1) Understand mathematical concept.

CO 2) Describe Kinetic theory of gases.

CO 3) To enrich Knowledge of chemical Kinetics.

CO4) To enrich Knowledge of thermodynamics and laws of thermodynamics.

#### **Paper II Inorganic Chemistry**

CO1) Understand atomic orbital and quantum number.

CO2) Describe ionization energy and trends in periodic table.

CO3) To enrich Knowledge of covalent bonding in VBT approach.

CO4) Study of covalent bonding in MOT approach.

#### **Semester-II**

#### **Paper III Organic Chemistry**

CO1) Understand Reaction mechanism of chemical reactions.

CO2) Describe homolytic and heterolytic bond breaking.

CO3) To enrich Knowledge of optical isomerism and geometrical isomerism.

CO4) Understand chemical reaction of alkanes and cycloalkanes.

CO5) Understand Reactions of alkene, alkyne, and dienes.

CO6) Understand aromaticity and aromatic electrophilic substitution reaction.

CO7) Study of structure and bonding of organic compounds.

#### **Paper IV Analytical Chemistry**

CO1) Understand Physical properties of liquids.

CO2) To enrich Knowledge of environmental chemistry related to Air Pollution and Water pollution.

CO3) Understanding of qualitative and quantitative elemental analysis.

CO4) Use and synthesis of petroleum and petrochemicals.

➤ **05 theory period per week .**

➤ **04 practical periods per week per batch of 20 students.**

### **B.Sc. II**

#### **Semester– III**

#### **Paper No. V Organic Chemistry**

CO I) Understand classification of alcohol, Understand preparation methods and chemical properties of Monohydric, Dihydric, Trihydric alcohol.

CO II) Understand preparation methods, Physical and Chemical properties of aldehydes and ketones.

CO III) Understand preparation methods, Physical and Chemical properties of Phenol.

CO IV) Understand preparation methods, Physical and Chemical properties of ethers and epoxides.

CO V) Understand preparation methods, Physical and Chemical properties of Monocarboxylic, hydroxy, unsaturated and dicarboxylic acids.

CO VI) Understanding of UV Spectroscopic methods for structure determinations.

CO VII) To enrich Knowledge of Stereochemistry related to geometrical and conformational isomerism.

### **Paper No. VI Inorganic Chemistry**

CO I) Understand physical and chemical properties of d-block elements.

CO II) Understand Co-ordination compounds, Nomenclature, preparation and VBT.

CO III) Understand Chelation and applications of related to EDTA and DMG.

CO IV) Understand concept of acids and bases.

### **Semester– III**

#### **Paper No. VII Physical Chemistry**

CO I) Understand the concept of entropy and Second law, third law of thermodynamics.

CO II) Understand electrochemistry along with transport number and Kohlrausch law.

CO III) Understand crystallography and crystal structure of NaCl and KCl.

CO IV) To enrich Knowledge of distribution law and applications on extraction process.

#### **Paper No. VIII) Analytical and Industrial Inorganic Chemistry**

CO I) Understand volumetric analysis in acid-base titrations and complexometric titration.

CO II) To enrich Knowledge of Gravimetric analysis and general steps involved in gravimetry.

CO III) To enrich Knowledge of Industrial heavy chemicals

CO IV) Understand of Metallurgy and steps in metallurgical process.

CO V) To enrich Knowledge of Iron and steel and process of extraction of iron and steel.

➤ **06 theory periods per week.**

➤ **08 practical periods per week per batch of 20 students.**

### **B.Sc.-III Semester–V**

#### **Paper No. IX Physical Chemistry**

CO1) Understand Phase rule and Reduced phase rule with one and two component systems.

CO2) Understand electromotive force types of electrodes and cells with applications of emf.

CO3) Understand Photochemistry, photodimerization reactions with joblonski diagram.

#### **Paper No. X Inorganic Chemistry**

CO1) Understand metal ligand bonding in transition metal complexes with CFT and MOT.

CO2) Knowledge of nuclear reactions and applications to nuclear reactor and atom bomb.

CO3) To enrich Knowledge of bioinorganic chemistry.

CO4) Understanding of inorganic polymers and methods of preparation.

CO5) Concept of Nanotechnology.

#### **Paper XI Organic Chemistry**

CO1) Understand IR, NMR, Mass spectroscopy for structure determinations.

CO2) To enrich Knowledge of stereochemistry and conformations of cyclohexane's.

CO3) Describe enolate ion, enolization, tautomerism.

CO4) Study of Name reactions.

#### **Paper XII Analytical and Industrial Physical Chemistry**

CO1) Understand colorimetric measurement.

CO2) Understand potentiometric measurement.

CO3) Understand conductometric measurement.

CO4) To enrich Knowledge of flame photometry.

CO5) To enrich Knowledge of electroplating to Metals.

### **Semester- VI**

#### **Paper No. XIII Physical Chemistry**

CO1) Understand of physical spectroscopic methods.

CO2) Understand Free energy concepts in thermodynamics.

CO3) Understanding of rate of reactions and 3<sup>rd</sup> order equation.

CO4) To enrich Knowledge of types of solutions.

#### **Paper No. XIV Inorganic Chemistry**

CO1) Understand f block elements and separations of lanthanides, synthesis of actinides.

CO2) To enrich Knowledge and properties of meta, semiconductor and superconductors.

CO3) Understand structural chemistry of boron, sulphur and phosphorous compounds.

CO4) Understanding of organometallic compounds.

CO5) To enrich Knowledge of corrosion and passivity.

#### **Paper No. XV Organic Chemistry**

CO1) Understand heterocyclic chemistry of pyrrole, pyridine, quinoline.

CO2) To enrich Knowledge of carbohydrates and reactions of carbohydrates.

CO3) To enrich Knowledge of vitamins and hormones.

CO4) Understanding of pharmaceutical chemistry.

CO5) To enrich Knowledge of agrochemicals and pesticides.

CO6) To enrich Knowledge of synthetic dyes and preparation methods.

#### **Paper No. XVI Analytical and Industrial Organic Chemistry**

CO1) To enrich Knowledge of soap and detergents.

CO2) Understand of synthetic polymerisation process.

CO3) Understand of principle of green chemistry.

CO4) To enrich Knowledge sugar industry and byproducts of sugar industry.

CO5) To enrich Knowledge of Chromatographic techniques.

- **12 theory periods per week.**
- **20 practical periods per week per batch of 16 students.**

### **Program Specific Outcomes**

#### **Microbiology**

- PSO1 – To enrich Knowledge of Microbiology and select, organize scientific information from proper source and communicate in logical manner.
- PSO2 – Describe the method of Microbial investigation.
- PSO3 – To enrich Knowledge of apparatus, Microscopes while performing experiments.
- PSO4 – To know the safety about how to carryout experiment.
- PSO3 – Understand basics of science and environmental awareness.
- PSO4 – Application of Microbiology To enrich Knowledge to explain observation and solve the problem.
- PSO5 – Understand biological reactions and principals.

### **Course Outcome**

#### **B.Sc. I (Semester I) CBCS Pattern**

##### **P – I - Introduction to Microbiology and Microbial Diversity:**

Students will learn about the classical introductory microbiology such as History of Development of Microbiology, Taxonomy, Morphology & Cytology of Bacteria, General characters of different groups of microorganisms -Cellular & cellular, An overview of Scope of Microbiology and their various life forms in different locality.

##### **P – II - Microbial Techniques:**

Students will learn about the Microscopy, Staining Techniques, Sterilization Techniques, Cultivation techniques of microorganisms.

#### **B.Sc. I (Semester II)**

##### **P – III - Microbial Biochemistry and Physiology:**

Students will learn about the Basic Biochemistry, Microbial Enzymes, Microbial Metabolism, Microbial Nutrition and Growth.

##### **P – IV - Applied Microbiology**

In this paper students will study about the environmental aspects such as water microbiology, sewage microbiology, milk microbiology, medical microbiology.

**Practical Course** – In this course students will study about the Good microbiology laboratory practices, Principle, working and applications of Common laboratory instruments, Preparation of Saline and culture media, Staining Procedures, Isolation of microorganisms from natural sources etc.

➤ 05 theory periods per week.

➤ 04 practical periods per week per batch of 20 students.

### **B.Sc. II (Semester III) CBCS Pattern**

#### **P – V - Cytology and Physiology of Microorganisms**

In this course students will study about **Ultra structure and Functions, Bacterial Growth, Effect of Environmental factors on Bacterial growth, Metabolism and virology.**

#### **P – VI – Bacterial Genetics**

In this course students will study about, various aspects of microbial genetics such as **Structure of nucleic acids & Replication of Bacterial DNA, Gene, Genetic code and Transcription, Bacterial Mutation, Bacterial Recombination.**

### **B.Sc. II (Semester IV)**

#### **P – VII - Immunology & Medical Microbiology**

In this course students will study about, various aspects of Immunology and medical microbiology such as, Immunity, Antigen and Antibody, Pathogenecity, Microbial Diseases.

#### **P – VIII – Industrail Microbiology – I**

In this course students will study about, various aspects of industrial microbiology such as, Fermentation Media, Screening, Inoculum Development and Scale Up, Microbiological assays, Specific fermentations such as Penicillin (*P.chrysogenium*), Alcohol (*S.cerevisiae*), SCP (*S. cerevisiae*), Probiotics.

In this course students will study about the practical based knowledge of Biochemical Tests, Effect of environmental factors on growth of microorganisms, Primary Screening:, Determination of Blood Groups – ABO & Rh, Isolation & Identification of Pathogenic Microorganisms from Clinical Samples

➤ 06 theory periods per week.

➤ 08 practical periods per week per batch of 20 students.

### **B.Sc. III (Semester V) CGPA Pattern**

#### **P – IX - Virology, Extremophiles and Bioinformatics**

In this course students will study about, various aspects of Virology such as Classification of Viruses, Reproduction of bacteriophages, Animal Viruses, Extremophiles, Bioinformatics.

### **P – X - Industrial Microbiology**

In this course students will study about, various aspects of Food and dairy Microbiology, Fermentation media, Industrial production, Production alcoholic beverages, Downstream processing and quality control.

### **P – XI - Agricultural Microbiology**

In this course students will study about, various aspects of Soil Microbiology, Role of microorganisms in Composting, Plant pathology, Applications of Biotechnology in Agriculture.

### **P – XII – Immunology**

In this course students will study about, various aspects of Complement system, Major Histocompatibility complex, Antibody production, Immunological tolerance and Autoimmunity, Immunohematology.

B.Sc. III (Semester VI) CGPA Pattern

### **P – XIII - Microbial Genetics**

In this course students will study about, various aspects of Basic concepts of microbial genetics, Effect of mutation in bacteria, Genetic complementation, Genetic engineering and Protein engineering, Techniques in molecular biology.

### **P – XIV - Microbial Biochemistry**

In this course students will study about, various aspects of Enzyme, Enzyme kinetics regulation, Extraction, purification and assay of enzymes, Assimilation of C, N, and Sulphur, Bioenergetics and Metabolic Pathways, Biosynthesis of: A) Nucleotides B) Protein C) Peptidoglycan

### **P – XV - Environmental Microbiology**

In this course students will study about, various aspects of Air microbiology, Marine microbiology and Fresh water ecosystem, Microbiology of potable water, Environmental impact assessment, Geomicrobiology and Industrial waste management.

### **P- XVI - Medical Microbiology**

In this course students will study about, various aspects of Microbial pathogenicity and hospital infection, Bacterial diseases, Viral Diseases, Chemotherapy, Fungal, Protozoan Diseases and Biological Warfare.

➤ 12 theory periods per week.

➤ 20 practical periods per week per batch of 16 students.

## **Program Specific Outcomes**

### **Computer Science**

PSO1- Know the generations, languages, organization, basic components of the computer and working of each device.

PSO2- Understand Concepts Number systems, Logic Gates, Boolean laws, theorems, flip flops and counter.

PSO3- Understand the structure and functionalities of an Operating System and the concept of process.

PSO4- Understand the fundamentals of C programming.

PSO5- Study of advanced concept of C programming and Computer Graphics Technologies

PSO6- Apply and Understand Object oriented features and C++ concepts.

PSO7- Understand basic concepts of software engineering, compare different software engineering process models and create architectural design for a given project.

PSO8- Develop Web based applications by HTML, JavaScript and CSS to have an interactive application.

## **Computer Science**

**Class: - B. Sc. –I (SEM -I)**

### **Paper Name- Fundamentals of Computer**

CO1: - Understand the computer system as well as Characteristics & features of computer.

CO2: - Learn what is flow chart and algorithm: its advantages and disadvantages.

CO3: - Understand the computer generations and ideas about early computers systems.

CO4: - Learn types of programming language.

CO5: - Study Microsoft Office i.e., Microsoft Word, Excel, and Power point.

CO6: - The Study of computer input and output devices and its types of IO device.

CO7: - Understanding the processor and instruction set.

### **Paper Name- C Language**

CO1: - Study of C language structure, history and features.

CO2: - Understanding basic elements operator used in C language.

CO3: -Study of Datatypes and its types.

CO4: Understand the control and Iterative statement with Examples.

CO5: -Study of Array and String.

**Paper Name- Digital Electronics**

CO1: -Identify basics of number systems used in computer science.

CO2: -Understand how the basic logic gates operate used to build complex computer circuits.

CO3: -Solve logic problems using K- Maps.

CO4: -Learn how combinational and arithmetic logic circuits are constructed.

CO5: -Study Flip-Flops and important building block for most sequential circuits.

CO6: -Understand the counters with various types.

CO7: -Understand Shift Registers and its input and Out puts.

**Class: - B. Sc. -I (SEM -II)**

**Paper Name- Introduction to Web Designing**

CO1: -Understand the concepts of HTML and HTML5.

CO2: - Understanding of CCS and its types.

CO3: - Introduction to Java Script and its Functions.

**Paper Name- Introduction to Programming Using C-II**

CO1: - Understanding of Function and Pointer.

CO2: - Understanding basic elements operator used in C language.

CO3: -Study of Datatypes and its types.

CO4: - Understand Array of Structure and Union.

CO5: -Study of Array and its types of arrays.

CO6: -To enrich Knowledge Of file handling, Micros processing and Graphics using C.

- **Five theory periods per paper per week per semester.**
- **Four practical periods per batch per week per semester.**

**Class: - B. Sc. –II**

**(SEM -III)**

**Class: - B. Sc. –II (SEM -III)**

**Paper Name- Object Oriented Programming using C++**

CO1: - Understanding the concept of Object oriented programming language and its features.

CO2: - Study of function in C++ programming language.

CO3:- Understand the concept of overloading and its use.

CO4:- Study of class and object and defining the class and objects.

CO5:- Study of constructor destructor and its types.

CO6:- Understanding concept of Inheritance, Polymorphism and Managing Console I/O Operators.

**Paper Name- Software Engineering**

CO1: - Understanding of System Concepts and Software Engineering.

CO3:- Study of Requirement analysis, fact finding techniques, and System Design.

CO4:- Understanding Relational data model and study of various normal forms

CO5:- Understand the Concepts of Configuration System and Software Testing.

**Class: - B. Sc. –II (SEM -IV)**

**Paper Name- Data structures**

CO1: - Learn the concept of Data structure and its types.

CO2: - Study of Sequential data structure array and types.

CO3:- Understand “What is linked list? How to represent memory in Computer.

CO4:- Study of Stack and various operations performed on stack

CO5:- Understand queue and various types of queue.

**Paper Name- Data Management System**

CO1: - Introduction to Database system.

CO2: - Understanding of Relational model and database design.

CO3:- Study of Relational algebra operations.

CO4:- Understanding Transaction Management and Concurrency Control.

CO5:- Understand Database recovery and atomicity.

CO6:- Study of SQL and PL/SQL, using oracle 11g.

- Six theory periods per paper per week per semester.
- Eight practical periods per batch per week per semester.

**Class: - B. Sc. –III**

**(SEM -V)**

**Paper Name- Visual Programming**

CO1: -Study of .NET Architecture.

CO2: - Understand C# basics.

CO3:- Study of objects and types of objects.

CO4:- Study of Inheritance and polymorphism.

CO5:- To enrich Knowledge of Exception handling.

CO6:- Understanding of Threading and file I/O Streams.

**Paper Name- Core Java**

CO1: - Understand Features of java.

CO2: - Study of Language fundamentals.

CO3:- Understanding of inheritance and interfaces.

CO4:- Understanding the concept exception handling and multithreading.

CO5:- Understand event handling and I/O programming.

**Paper Name- Operating system-I**

CO1: - Introduction to operating System.

CO2: - Understand the Structure of O.S.

CO3:- Study of Process management and scheduling.

CO4:- Understanding the concept Synchronization.

CO4:- Understanding of Deadlocks and memory managements.

**Paper Name- Data Communication and Networking-I**

CO1: - Introduction to Data Communication and Networking.

CO2: - Understanding of Network Models.

CO3:- Understanding of Physical layer.

CO4:- Understanding of Data link layer.

CO5:- Study of Network layer.

**(SEM -VI)**

**Paper Name- Web Technology**

CO1: -Introduction to ASP .NET.

CO2: - Understand Applications and page frameworks.

CO3:- To enrich Knowledge of ASP.NET Server Controls and validation control.

CO4:- Understand Working with Master pages.

Co5:- Study of ASP.NET State management.

CO6:- Understanding of Data access with ADO.NET.

**Paper Name- Advanced Java**

CO1: - Introduction to swing technology.

CO2: - Working with databases.

CO3:- Understanding of Servlets.

CO4:- Understanding of Java server pages.

CO5:- Understand EJB fundamentals and session beans.

**Paper Name- Operating system-II**

CO1: - Introduction to Linux operating System.

CO2: - Understand the installing of linux.

CO3:- Study of shell operations.

CO4:- Understand File management operations.

CO4:- Understanding of Vi editor and filters.

CO5:- To enrich Knowledge of shell programming.

**Paper Name- Data Communication and Networking-II**

CO1: - Introduction to Transport, Session, Presentation & Application layers.

CO2: - Understanding of Network Security.

CO3:- Understanding of Network devices and services.

CO4:- Understanding of Web security.

CO5:- Case Study of Linux.

- **Twelve theory periods per paper per week per semester.**
- **Twenty practical periods per batch per week per semester.**

### **Program Specific Outcomes**

#### **Mathematics**

PSO1- To provide the tools to get the easy and precise outcome to various applications of science and technology.

PSO2- Logical development of the various algebraic statements can be made to develop the innovative approach of various concepts and it can be applied to various abstract things.

PSO3- In the theory courses of algebra, analysis, differential calculus, differential equations various deductions of the theorems, corollaries and lemmas will be acquired by the students.

PSO4- To learn various techniques to find solutions of differential equations.

PSO5- To generate intelligent and skilful human beings with adequate theoretical and practical knowledge of the various mathematical systems.

PSO6- To inculcate conceptual understanding in basic phenomena, statements, theorems and development of appropriate problem-solving skill suitable for applications and abstract algebra technique, sufficient logical connectivity is provided.

### **Course Outcome**

#### **MATHEMATICS**

#### **B.Sc. I Year**

#### **Semester-I**

##### **Paper I Algebra**

To Understand the problem solving and applications in Matrices, Linear equations, Complex number and Transcendental functions.

##### **Paper II Calculus**

To Understand problem solving of Differentiation, Function of two variables, Reduction formulae and Vector calculus.

#### **Semester-II**

##### **Paper III Geometry**

To get the knowledge of Change of axis, Plane and Sphere.

##### **Paper IV Differential Equation**

To Understand Differential equations of first order and first degree, Linear differential equations with constant coefficients.

- ➤ **05 theory period per week .**
- ➤ **04 practical periods per week per batch of all students.**

## **B.Sc. II**

### **Semester– III**

#### **Paper No. Differential Calculus**

To understand the concepts of Tangents, Normal, Curvature, Jacobians, Maxima and Minima.

#### **Paper No. Real Analysis**

To get the knowledge of Real numbers, Real sequences, Infinite Series.

### **Semester– III**

#### **Paper No. Differential Equations**

To understand the problem solving of Differential equation of the first order and higher degree, Linear equation of the second order, Homogeneous linear equations, simultaneous equations and Total differential equations.

#### **Paper No. Abstract Algebra**

To get the knowledge of Group theory, Equivalence, Congruence, Divisibility, Groups, Group Homomorphism concepts.

- **06 theory periods per week.**
- **03 practical periods per week per batch of students.**

### **Program Specific Outcomes**

#### **English**

PSO1- To comprehend the language skill.

PSO2- Use some simple language expression in day to day life.

PSO3- To develop the vocabulary of the students.

PSO4- To improve the communicative skills of the students.

PSO5- To strengthen students reading comprehension skills and give them an opportunity for developing literary sensibility and taste.

## **Course Outcome**

### **ENGLISH**

#### **B.Sc. I**

#### **Semester-I**

##### **Paper I**

CO1:-The prose and poetry section aim to strengthen students reading comprehension skills and give them an opportunity for developing literary sensibility and taste.

CO2:-The section on grammar and vocabulary provide brief guidelines on the form and the function of language.

CO3:-The section on communication skill includes some topics on useful oral and written communication.

#### **Semester-II**

##### **Paper II**

CO1:-The prose and poetry section aim to strengthen students reading comprehension skills and give them an opportunity for developing literary sensibility and taste.

CO2:-The section on grammar and vocabulary provide brief guidelines on the form and the function of language.

CO3:-The section on communication skill includes some topics on useful oral and written communication.

➤ **04 theory period per week .**

#### **B.Sc. III**

#### **Semester– V**

CO1:- To make students aware of the different communicative skills, - Listening Reading ,Writing and Speaking.

CO2:- To develop among them an ability to effectively communicate in English, both in written and spoken modes.

#### **Semester– VI**

CO1:- To make students aware of the different communicative skills, - Listening Reading ,Writing and Speaking.

CO2:- To develop among them an ability to effectively communicate in English, both in written and spoken modes

➤ **04 theory periods per week.**

### **Program Specific Outcomes**

#### **Zoology**

PSO1- To provide an intensive and in depth learning to the students in the field of zoology.

PSO2- Beyond simulating, learning, understanding, the techniques.

PSO3- To address the underlying recurring problems of discipline in today scientific and changing world.

PSO4- To develop awareness and knowledge of different organization requirement and subject knowledge through varied branches and research methodology in students.

PSO5- To train the students to take up wide variety of roles like researchers, scientists, consultant, entrepreneurs, academicians, industry leaders and policy.

### **Course Outcome**

#### **ZOOLOGY**

#### **B.Sc. I**

#### **Semester-I**

#### **Paper I Animal Diversity-I**

CO1:-To study and understand the concepts of classification of Kingdom as Protista and Porifera.

CO2:-To understand the morphology of Coelenterate, Platyhelminthes and Annelida.

#### **Paper II Cell Biology and Genetics**

CO1:- Principal and applications of Compound and electron Microscope.

CO2:-Study of Nucleus with reference to Nuclear membrane, Nucleoplasm, Chromatin and Nucleolus.

CO3:-Study of Ultra structure and functions of Plasma membrane, Mitochondria, Endoplasmic reticulum, Golgi complex, Lysosome, Ribosome and Giant Chromosomes.

CO4:-Study of Mendelian inheritance, Codominance, incomplete dominance, Multiple alleles, Sex determination .and Human genetics.

## **Semester-II**

### **Paper III Animal Diversity-II**

CO1:- To study the Classification of Chordates, Cyclostomatous and Fishes.

CO2:- Study of Amphibia ,Neoteny and Parental care in Amphibia.

### **Paper IVEcology, Ethology, Evolution and Applied Zoology**

CO1:- Introduction, definition, aim and Scope of Ecology, Biotic factors and Abiotic factors.

CO2:- To study brief idea of Species, Community, Niche, Ecosystem, Biome and Biosphere.

CO3:- To study Ecological Successions.

CO4:- To study Ethology, Evolution and Applied zoology.

□ ➤ **05 theory period per week .**

□ ➤ **04 practical periods per week per batch of 20 students.**

## **B.Sc. II**

### **Semester- III**

### **Paper No. V Animal Diversity-III**

CO1:- To study the Taxonomy of of Arthropoda, Mollusca, Echinodermata and Hemichordata.

CO2:- Systematic and complete body Study of Cockroach.

CO3:- Systematic and complete body Study of Pila.

### **Paper No. VI Economic Zoology**

CO1:- Study of Cell science and cell division interns of Mitosis and Meiosis.

CO2:- Study of Genetics with Mechanism, Gene interaction, Human genetics.

CO3:- Understanding of Biological Chemistry.

CO4:- Economic Zoology of Fishery, Sericulture and Agriculture.

CO5:- To get the knowledge of Dairy science, Poultry science and Goat farming.

#### **Semester– IV**

##### **Paper No. VII Animal Diversity-IV**

CO1:- To study Taxonomy of Reptiles, Birds and Mammals.

CO2:- Systematic and Complete body study of Rat.

CO3:- Study of Mesozoic reptiles, Monotremes, marsupials and Mammals.

CO4:- Study of Poisonous and non-poisonous snakes .

CO5:- Study of Birds.

##### **Paper No. VIII Histology and Physiology**

CO1:- Study of Tissues.

CO2:- Study of Histology with Tooth, Tongue, Salivary gland, Stomach, Ileum, Liver, Pancreas, Kidney, Testis, Ovary and Uterus.

CO3:- Understanding of Reproductive Physiology.

CO4:- Study of Contraceptives with Male and Female.

CO5:- Study of Body Defence Mechanism.

➤ **06 theory periods per week.**

➤ **08 practical periods per week per batch of 16 students.**

#### **Program Specific Outcomes**

##### **Physics**

PSO1 – To understand the concept of Physics and to introduce various branches of physics.

Information about Mechanics and Properties of Matter.

PSO2 –Introduction to Optics and Laser. Information to different types of eyepieces.

Construction, Working and application of spectrometer and Optical bench.

PSO3 – Knowledge of Lasers and its applications in day today life.

PSO4 – To know the working principle and mechanism of Heat engines, Refrigerator etc.

PSO5 – Introduction to Electronic circuit components and various devices.

PSO6– Application of electronics circuit components and LASERS.

PSO7– Knowledge of Heat and Thermodynamics.

PSO8- To understand principle, construction and working of Heat engines, Refrigerator.

PSO9- Knowledge about Magnetostatics and Ballistic Galvanometer.

## **Course Outcome**

### **Physics**

#### **B.Sc. I Year**

#### **Semester-I**

#### **Paper I Mechanics and Properties of matter**

CO1) Understand definitions and general properties.

CO 2) To study different types of pendulums.

CO 3) Knowledge of Elasticity and its properties.

CO 4) Knowledge of surface tension and its properties.

CO 5) Determination of viscosity and its properties.

#### **Paper II Optics and LASER**

CO 1) To Understand Geometrical Optics and Laser.

CO 2) Describe construction, working and principal of different types of eyepieces.

CO 3) To study Interference and diffraction of light.

CO 4) Study of different types of Lasers and its applications.

## Semester-II

### Paper III Heat and Thermodynamics

- CO 1) Knowledge of transport phenomenon.
- CO 2) Describe Liquefaction of gases.
- CO 3) Knowledge of thermodynamics and Its laws.
- CO 4) Understand principle and mechanism of Heat engines and refrigerator.

### Paper IV Electricity, Magnetism and Basic Electronics

- CO 1) Varying currents through L-R, C-R and L-C-R circuits
- CO 2) Series and parallel resonance in L-C-R circuits and quality factor.
- CO 3) Introduction to Magnetostatics and Ballistic Galvanometer.
- CO 4) knowledge of Electronics Circuit Components and Devices.
- CO 5) Construction and working of transistor, I/P O/P and transfer characteristics of different modes.

- ➤ **05 theory period per week .**
- ➤ **04 practical periods per week per batch of 20 students.**

## B.Sc. II

### Semester- III

### Paper No. V General Physics, heat and Sound

- CO I) Understand Scalar and Vector triple product and their physical significance.
- CO II) Understand precessional motion, gyroscope and gyrostatic pendulum.
- CO III) Determination of Young's Modulus and Modulus of rigidity of bending of beam.
- CO IV) Determination of viscosity by Searls and Ostwalds Viscometer.
- CO V) Physical concept and significance of entropy, T-S diagram.

CO VI) Understanding different sound producing devices, good requirements of acoustics and detection of Ultrasonic

### **Paper No. VI Electronics**

CO I) Understand Transistor amplifier and differential amplifier .

CO II) Understand types of waveforms and different types of Oscillator.

CO III) Construction ,Operation and characteristics of FET and UJT .

CO IV) Construction and working of RS and JK flip flop.

CO V) Regulated power supply Line and Load Regulation Using IC 78XX and 79XX.

CO VI) Block diagram of CRO and Digital Multimeter with its applications.

### **Semester– IV**

#### **Paper No. VII Optics**

CO I) Concept of cardinal points of optical system and graphical construction.

CO II) Understand Interference of light and types of Interferometer.

CO III) Understand diffraction and construction ,working of Zone.

CO IV) Determination of resolving power of prism and plane diffraction of grating.

CO V) Understanding of polarisation and applications.

CO VI) Structure and types of fibers. Advantages of optical fiber.

#### **Paper No. VIII) Modern Physics**

CO I) Understand Theory of relativity ,Ether Hypothesis, Michelson-Morley experiment and Lorentz transformations.

CO II) Knowledge of De Broglie hypothesis, properties of matter waves. Heisenberg's uncertainty principle.

CO III) Knowledge vector atom model, L-S coupling and Zeeman effect.

CO IV) Understanding and experimental verification of Compton effect.

CO V) Knowledge of Nuclear energy sources .

➤ **06 theory periods per week.**

➤ **08 practical periods per week per batch of 16 students.**

### **Program Specific Outcomes**

#### **Botany**

PSO1 – To understand the concept of Botany and to introduce various branches of Botany.

Information about different types of plants .

PSO2 –Introduction to Biomolecules. Information to different types of Chemical bonds .

PSO3 – Knowledge of Environment and different Ecosystem.

PSO4 – To know the role of different type of tissue systems.

PSO5 – Introduction to Bacteria and Viruses.

PSO6– Economic importance of different plant groups.

PSO7– Knowledge of Angiosperm Taxonomy.

PSO8- To understand ecological adaptations.

PSO9- To know about plant physiology .

## **Course Outcome**

### **Botany**

#### **B.Sc. I Year**

#### **Semester-I**

##### **Paper I Microbiology and Phycology**

- CO 1) To know about viruses and their economic importance.
- CO 2) Know about Bacteria and Mycoplasma with their significance.
- CO 3) To enrich knowledge about the different type of Algae .
- CO4) To learn the role of Algae in the Environment , Agriculture and Biotechnology .

##### **Paper II Biomolecules and Cell Biology**

- CO1) Study of significance of chemical bonds in biomolecules , structure and properties of water as well as to know about the significance of pH and buffers.
- CO2) To know about cell its types and parts of cell.
- CO3) To enrich Knowledge about different microbodies.
- CO4) Learn the process of cell division.

#### **Semester-II**

##### **Paper III Mycology and Phytopathology**

- CO1) To study about different groups of Fungi with respect to their general characters ,thallusorganisation , cell wall composition , nutrition and classification.
- CO2) To enrich the knowledge in the field of symbiotic associations between different organism.
- CO3) To study about the Lichens and Mycorrhiza.
- CO4) To study the role of fungi in Biotechnology and Agriculture .
- CO5) Understand the different plant diseases.

##### **Paper IV Archegoniates (Bryophytes, Pteridophytes and Gymnosperms)**

CO1) To study unifying characters of Archegoniates and alternation of generation .

CO2) Understand life cycle of Bryophytes, Pteridophytes and Gymnosperms.

CO3) Know about the significance and economic importance of Archegoniates.

□ ➤ **05 theory period per week .**

□ ➤ **04 practical periods per week per batch of 20 students.**

## **B.Sc. II**

### **Semester– III**

#### **Paper No. V Anatomy and Taxonomy of Angiosperms**

CO I) To understand different theories of plants structural development.

CO II) To study different Tissues , Tissue systems and their function .

CO III) Understanding terminologies of Angiosperm Taxonomy.

CO IV) Study of different plant families with plants of economic importance.

#### **Paper No. VI Plant Ecology**

CO I) Understand different climatic and edaphic factors .

CO II) To study community ecology with community characteristics and Ecosystems.

CO III) Understand concept of ecological succession and it's type viz such as Hydrosere and Xerosere .

CO IV) To know about different types of pollution and different polluting agents.

### **Semester– III**

#### **Paper No. VII Plant Physiology and Cytogenetics**

CO I) Understand the process of Photosynthesis and significance of Photosynthesis.

CO II) To study the Nitrogen metabolism and significance of biological Nitrogen fixation.

CO III) Understand Mendelian Genetics and gene interactions.

CO IV) To enrich the knowledge about genetic linkage and crossing over with significance.

CO V) To understand multiple allelism with different examples.

**Paper No. VIII) Economic Botany**

CO I) Understand economic importance of different plant groups.

CO II) To study brief account of cultural practices of Groundnut and Soybean.

CO III) To know the methods of rubber extraction.

COIV) To study about plant perfumes.

➤ **06 theory periods per week.**

➤ **08 practical periods per week per batch of 16 students.**