PROGRAMME - BACHELOR OF SCIENCE (B.Sc.)

Program Outcomes

Students after completing this program of Bachelor Science i.e. B.Sc. are expected to get equipped with following outcomes:

a. Acquire the knowledge of the basic scientific principles and methods as well as develop scientific attitude in the fields of mathematical, chemical, life and physical sciences.

b. Inculcating scientific thinking and awareness among the student.

c. Ability to utilize knowledge to extract information, formulate and solve problems in systematic manner.

d. To develop an ability to express themselves with others in regional language and in English.

e. Ability to work in such a manner by logical thinking, critical analysis and scientific temper to overcome the common problems occur in society.

f. He /she should become sensitive to protect and develop surrounding natural wealth, natural resources.

g. Students get prepared for competitive examinations for civil services as well as technical services

h. Develop Value based society.

PROGRAMME - MASTER OF SCIENCE (M.Sc.)

Program Outcomes

Students after completing this program of Master Science i.e. M.Sc. are expected to get equipped with following outcomes:

a. Ability to develop research methodology for research using the principles basic sciences.

b. Develop personal skills and ability required for further research.

c. To prepare students for different instrumentations and make them master in it.

d. To build personality who takes challenges without fear.

e. To develop an ability to think rationally and fight against evil deeds in society.

f. To prepare an individual to acquire knowledge in particular subject thoroughly.

N.C.C

Programme Outcomes - N.C.C

1. The organization with its motto, "Unity and Discipline" is the back bone of the nation.
2. The 'Aims' of the NCC laid out in 1988 have stood the test of time and continue to meet the requirements expected of it in the current socio–economic scenario of the country.
3. The NCC aims at developing character, comradeship, discipline, a secular outlook, the spirit.
4. A sense of patriotic commitment to encourage cadets to contribute to national development.
5. Respect for diversities in religion, language, culture, ethnicity, life style and habitat to instill a sense of National unity and social cohesion.
6. Abiding commitment to learn and adhere to the norms and values enshrined in the Indian Constitution.
7. Understanding the value of a just and impartial exercise of authority.
8. Ability to participate in community development and other social programme.

9. A healthy life style free of substance abuse and other unhealthy practices.
10. Sensitivity to the needs of poor and socially disadvantaged fellow citizens.
11. Inculcating habits of restraint and self-awareness.
12. Understanding the values of honesty, truthfulness, self-sacrifice, perseverance and hard work.
13. Respect for knowledge, wisdom and the power of ideas.

N.S.S.

Programme Outcomes- NSS

The motto of National Service Scheme is **NOT ME BUT YOU**

A NSS volunteer who takes part in the community service programme would either be a college level or a senior secondary level student. Being an active member, these student volunteers would have the exposure and experience to be the following:

- an accomplished social leader
- an efficient administrator
- a person who understands human nature.

Physical Education

Programme Outcomes- Physical Education

A sound body have sound mind is true and hence in sports and physical education are expected to get equipped with following outcomes:

1. To develop sportsman spirit.
2. To inculcate the significance of practice Perseverance and participative involvement in physical exercise.
3. Individuals for attaining specific goals.
4. Summarize and analyze current issues in healthiness and wellness.

To achieve increased muscular strength and endurance.

Program Specific outcomes

B. Sc. - Botany

1. A Large section of botany graduates seek admission in post graduate and higher studies in environmental science, Natural science, agriculture.
2 Many Botanists work in different national level institutes and laboratories as a taxonomist, geneticist, and cell biologist.
3. Ayurvedic, homeopathy, Unani and other Pharmaceutical industries.
4. They become eligible for examination conducted by UPSC for Indian Forest Services in Forest Department as well as banking and civil services.
5. They works into fields like environmental monitoring and protection, agriculture.
6. A good number of Botany students pursue for post graduate in natural science, agriculture, environmental sciences, and education.

7. Students works to develop organic farming bio-fertilizers production.
8. Majority of botanists work in seed companies, laboratories, museums, in botanical gardens, Landscaping, Plant Nurseries and gardening industry.
9. Many Botanists work outdoors in forests or fields for Plants identification.

B.Sc. - Chemistry

1. Knowledge of basic principles and applications chemistry is inculcated through this programme.
2 . Analytical skills which are essential in every field are developed along with knowledge of melting point, boiling point, surface tension, viscosity, optical activity etc.
3 . Development of ability to handle different instruments personally.
4 .Large numbers of students pursue for higher education in chemical, physical and life sciences.
5. Aware of applications of mathematics in chemistry practical.
6. Develop understanding of the role of chemistry in daily life and use of different methods of compound analysis.

B.Sc. Computer Science (optional subject)

This programme makes learners aware of the history of the discipline of Computer Science and understand the conceptual underpinnings of subject.
Students understand the nature of the software development process, including the need to provide appropriate documentation.
The program also empowers the graduates to appear for various competitive examinations or choose the post graduate programme of MSc Computer Science.
Understand the nature of the software development process, including the need to provide appropriate documentation.
Understand standard techniques for solving a problem on a computer, including programming techniques and techniques for the representation of information.

B. Sc. Electronics

1.B.Sc. Electronics is the discipline of science, engineering and technology that deals with the electrical circuits that include dynamic electrical parts and components. This degree course is the study and investigation of the fundamentals of Analogue Electronics, Communications, Electromagnetic, Digital System Design, Optoelectronics and Mathematics. In other words, B.Sc. Electronics degree program is the comprehensive study which provides a wide foundation on the basics of electronics.

2.B.Sc. Electronics degree candidates have ample of employment opportunities in Communication, Information Technology, Manufacturing, Banking, Finance, Marketing, Education, Entertainment, Defense, Quality Product Manufacturing, Automobiles etc and in different other fields. The degree program provides candidates with skills that are required to design electronic, electrical, computer, automation as well as communication systems.

3.Such postgraduates are hired in capacities such as Service engineer, Broadcast and Sound Technician, Electronic Sales Manager, Electronics and Communication Consultant, Electronics

Technician, Technical Leader, Project Manager, Manufacturing Head, Site Maintenance Technician, Marketing Manager etc.

4.Electronics is a branch of science and technology which studies the controlled movement of electrons through different media and vacuum. Subjects basically studied under this program are Digital Electronics, Engineering Materials, Analog Electronics, Data Structure, Electromagnetics, Quantum Mechanics, Programming Languages, Statistics, Mathematics, Fundamentals of Electronics, Network Analysis, Signals and Devices as well as Computational Skills.

5.B.Sc. Electronics treats with vacuum tubes, diodes, transistors and integrated circuits. The electronics sector is developing at the speediest level these days and in high demand as well as improvement and development are occurring in electronics sectors. This sector provides extensive options for candidates who are interested in manufacturing and designing electronic devices.

6.B.Sc. Electronics degree program serves as a basis for higher studies in this field, for example, M.Sc., M. Phil and PhD Degree in the branch of Electronics

B. Sc. Fishery Science .

1. Students get aware of the life cycle of fishes and their feeding habits.

2. They become able to work independently in fishery industry like developing seeds of fish and providing it to fishermen.

3. Many students work in different national level institutes and laboratories as a taxonomist, geneticist, and cell biologist related to fish.

4. A good number of students pursue for post graduate in natural science, pisciculture, environmental sciences, and education.

Mathematics.

1. The course increases the thinking capacity of the students.
2. The course develops the skill of applications of mathematics to the real value problems.
3. The course enables to study the numerical methods for the problems.
4. The course gives the ideas of number systems and their extension.
5. The course gives the ideas and methods to solve different differential equations.
6. The course enables to learn abstract mathematics.
7. The course enables to generalize the ideas in mathematics.
9. The course gives the ability to solve linear differential equations of nth orders.
10. The course is able to conduct the self-evaluations and continuously enrich themselves through lifelong learning.
11. The course is able to setup mathematical models of real-world problem and obtain their solutions

B. Sc. Physics

While pursuing B.Sc. with Physics as one of the optional subjects, the students will be able:

1. To get aware of basic concepts in General Physics
2. To understand principles of Optics, Thermodynamics and Mathematical Physics
3. To handle different measuring instruments in laboratory
4. To gain knowledge of mathematical Physics, Electronics and Statistical Physics
5. To become aware of basic Laws of practical Physics
6. To record conclusions on from basic experiments
7. To understand different types of atomic arrangements in crystalline solids.
8. To gain insight into classical, quantum theory and Electrodynamics
9. To learn fabricating techniques and applications of Optical fibres
10. To study LASER and its applications

B. Sc. - Zoology

1. It develops the deep knowledge of evolution ,behaviors and physiological aspects of animals.
2. A good number of students pursue for post graduate in natural science, animal husbandry, pisciculture sericulture, environmental sciences, and education.
3. They become eligible for examination conducted by UPSC for Indian Forest Services in Forest Department.
4. They get develop qualities of a science - Identification, classification, observation, clarity of thought and expression, systematic approach, morphological and anatomical knowledge making
5. This programme enables the learners to perform the jobs in diverse fields such as Forest department, Genetic engineering, Zoological survey of India, Agricultural sector, Academicians, self-business etc.

B. Sc. Biotechnology

Biotechnology is modern branch of science in which biological techniques used to make products which improve quality of life. This scientific career paths can have many branches. Careers begin with technical education at three-year college, it prepares students for working in industry by providing hands-on education through associates and bachelor's degree programs. colleges also offer certificates that focus on technical skills. As individuals gain experience, and can advance their careers through promotions, new jobs, or additional education and advanced degrees. The most prominent area of is the production of therapeutic proteins and other drugs through genetic engineering. Biotechnology companies are those that employ living organisms or biological substances for the development of products and services with applications in numerous fields such as use of microorganisms in order to make bread, alcoholic beverages, and cheese and to preserve dairy products. Contribution of biotechnology is tremendous in fields like waste management, food processing, agriculture and pharmaceutics. Companies categorized as Biotechnology-Therapeutics and Diagnostics are those whose core business is the application of biotechnology to the discovery and development of novel therapeutic compounds and probe molecules for applications in medicine. These biotechnical industries consist of alteration in the DNA for a useful protein into production cells which then begin to produce the protein in large quantity and often a produced cell, a new organism. Insulin is the first product made through genetic engineering. Since then,

numerous genetically engineered protein products and medications have been commercialized around the world, including recombinant versions of growth hormone, clotting factors, proteins for stimulating the production of red and white blood cells, interferons, and clot-dissolving agents.

B. Sc. - Computer Science

This programme makes learners aware of the history of the discipline of Computer Science and understand the conceptual underpinnings of subject.

Students understand the nature of the software development process, including the need to provide appropriate documentation.

The program also empowers the graduates to appear for various competitive examinations or choose the post graduate programme of MSc Computer Science.

Understand the nature of the software development process, including the need to provide appropriate documentation.

Understand standard techniques for solving a problem on a computer, including programming techniques and techniques for the representation of information.

M.Sc. - Chemistry

1. They get knowledge about handling of sophisticated instruments which is one of the essential need of laboratories as well as industries.
2. they become master in application of knowledge of basic chemistry to advance studies- named reactions, reagents, heterocyclic compounds, natural products in living organisms and their roles.
3. Analytical skill in spectroscopy for understanding structure of molecules and compounds is developed.
4. At the end of course they go with the knowledge of drugs design and retro-synthetic approach.
5. Performing reactions, monitoring them independently and characterizing the products which are the foundations of industries. They able to get highly responsible positions in scientific, industrial and academic sectors.
6. Research methodology, problem identification, referencing all these skills are developed.
7. The programme makes students able to qualify competitive exams such as GATE, SET, NET-JRP.

Course Outcomes

B. Sc. Botany

Diversity of Cryptogams-I

1. Introduction of Microorganisms like viruses, mycoplasma, bacteria. Their structure, classification, multiplication, economic importance.
2. Introduction about plant group like Algae and Fungi and their structure, classification, reproduction, economic importance.
3. To teach the students the skills like keen observation, identification, and classification.
4. Make aware about the value of cryptogrammic plants in the ecology.

Morphology of Angiosperms

1. Introduction of basic body plan of flowering plants their growth, diversity etc.

2. Students gets practical knowledge of morphology of flowering plants.
3. Students become aware of the structure and functions of the reproductive parts of the flowering plants.
4. They develop knowledge about fruits and seeds.

Diversity of Cryptogams-II

1. To familiarize with morphological features of Bryophytes and Pteridophytes.
2. Analyze the specific characteristics features of these plant groups in relation with its anatomical features.

Histology, Anatomy and Embryology

1. To get detail knowledge of anatomical structure of plant parts
2. To apply this knowledge in Wood and timber Industry, Forensic science.
3. To understand seed structure and seed certification.

Taxonomy of Angiosperm

1. Familiarize with salient features, basic terminology, plant systematic and types of classifications, concept of binomial nomenclature, genus, species and epithet.
2. To indulge in identification of Angiosperm plants and to become aware of their importance.

Plant Ecology

1.Students become familiar with the environmental science and its vast impact on man's survival.
2. Knowledge of phytogeography India and its biodiversity.
3. To develop ability of characterization of plant for the understanding ecological adaptation.
4. To inculcate habit of conservation and sustainable utilization.

Gymnosperms and Utilization of plants

1. To make aware about the salient features, classification and economic importance of Gymnosperms and Angiosperms.
2.Become aware of domestication, history, origin, cultivation, harvesting, improved varieties of food grain plants, sugar, fibers, vegetable oils, spices, cosmetics and perfumes beverages, mushroom, medicinal plants, timber and gum yielding

Plant Physiology

1. To understand different life process taking place in plants, role of nutrition in development of plants and their deficiency symptoms.
2. Get aware with the structure, properties and function of enzymes

Cell and Molecular Biology

1. To get knowledge of structure of cell, cell types, cell structure, cell organelles and their functions.
2. To get the detailed knowledge of cell division i.e. mitosis and meiosis process and significance
3. To develop skills of application of knowledge in industries and day to day life.
4. to develop ability to apply the knowledge of nucleic acids, chromosomes in awareness of people for wellbeing of society.

Diversity of Angiosperms-I

1. Get aware about the plant resources and their modest utilization in life.

2. Study identification of plants on the basis of various morphological aspects.
3. Participate in laboratory experiments for understanding the basic principles of taxonomy and helpful for gaining primary information.

Genetics and Biotechnology

1. To Study basics of genetics and create awareness in society about its impact on whole world.
2. To focus on importance of Biotechnological processes for improvement and satisfaction of all needs of human kinds
3. To give basic information regarding the plant biotechnology and its application in agriculture, Horticulture, medicinal and industrial crops.

Diversity of Angiosperms-II

1. Study identification of plants on the basis of various morphological aspects
2. To study its eco-friendly conservation and sustainable utilization of plants
2. Knowledge about the local flora.**B.Sc. Chemistry**

B.Sc. I semester

Paper I Inorganic Chemistry

1. To study the basics of atomic structure - Atomic orbitals, Quantum numbers, Heisenberg uncertainty, Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements, Bohr's atomic model.
2. To understand some periodic properties - atomic and ionic radii, ionization energy, electron affinity and electro negativity with reference to trends in periodic table and application in predicting chemical behavior.
3. To study s and p- block elements.

Paper No. II Organic Chemistry

1. To understand basic concepts in organic chemistry- reactions, reagents and mechanisms of organic reactions.
2. To study stereochemistry and its importance.
3. To familiarize open chain compounds like alkanes, alkenes and aromatic compounds chemistry and their importance.

B.Sc. II Semester

Paper IV Physical Chemistry

1. To understand basic mathematical concepts - logarithmic relations, curve sketching, linear graphs and calculation of slopes, differentiation of functions simple mathematical functions, maxima and minima, partial differentiation.
2. To understand kinetic theory of gases, kinetic gas equation, and gas laws - Boyles Law, Charles Law, Grahams Law of diffusion, Avogadro's hypothesis, deviation from ideal behavior, van der Waals equation of state. Critical Phenomena: PV isotherms of real gases.
3. To study chemical kinetics: Factors influencing the rate of reaction, rate law and

characteristics of simple chemical reactions - zero order, first order, second order, Pseudo order, half life. Arrhenius equation, concept of activation energy. Catalysis: Definition, types, and characteristics, Enzyme catalysis.

4. To understand basics of liquid and solid state - Intermolecular forces, structures, liquid crystals: Classification, structure of nematic and cholestric phases.
5. To study solids, Miller Indices, laws of crystallography, X-ray diffraction by crystals. Derivation of Bragg equation.
6. To familiarize with colloidal state.

Paper V Inorganic Chemistry - II

1. To understand chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds.
2. To understand types of bonds- ionic, covalent and coordinate, Hydrogen bonding, Van-der-Waals forces, Metallic bond Theories of bonding - VBT, VSEPR, MOT with formation and shapes of molecules.
3. To understand the basics of nuclear chemistry - Isotopes, Isobars mass, Binding Energy, Packing fraction N/Z ratio, Radio activity, properties of fundamental particles, Artificial transmutation. Applications with respect to trans-uranic elements, carbon dating.
4. To study theory of volumetric analysis - Types of titrations, volumetric apparatus, calibration of pipette and burette, indicators used in pH - titrations, oxidizing agents used in titrations. Theory of Internal, External and self indicators for redox titration.

B.Sc. III semester

Paper VII (Organic Chemistry)

1. To understand structure, reactivity, and methods of preparation and chemical reactions of different types of compounds - alcohols, Phenols, aldehydes-ketones, amines and carboxylic acids.
2. To study named reactions- Pinacol-Pinacolone rearrangement, Fries Rearrangement, Claisen Rearrangement, Gatterman Synthesis and Reimer Tiemann Reaction, Baeyer-Villeger Oxidation, Benzoin, Aldol Knoenenagel condensations, Mannich Reactions. Hoffmann Bromamide Reactions, Gattermann- Koch synthesis, Hell-Volhard-Zelinsky Reaction. Regents in organic chemistry - $LiAlH_4$, LTA, PTC.
3. To understand the basic functional group transformations, Aromatic electrophilic substitution reactions, nucleophilic additions.

Paper VIII (Physical Chemistry-I)

1. To understand the basic concepts in thermodynamics.

2. To understand the laws of thermodynamics and terms like W, q, du and dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process, Hess's law.
3. To study Carnot cycle, its applications, concept of entropy, Gibbs and Helmholtz Functions, Criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation A with P, V and T.
4. To understand equilibrium constant and free energy - law of mass action, Le Chatelier's principle, Reaction isotherm and reaction isochore, Clapeyron equation, Clausius-Clapeyron equation.

B.Sc. IV Semester

Paper X (Inorganic Chemistry)

1. To familiarize with transition elements, lanthanides and actinides with reference to characteristics, position in periodic table and variation in periodic properties.
2. To understand concepts and theories in coordination compounds -Werner's co-ordination theory, EAN rule, VBT, isomerism, chelates.
3. To understand the concepts of acids and bases - Arrhenius, Bronsted-Lawry, Lux-Flood, Solvent System and Lewis Concept of Acids and Bases
4. To study chemical reaction in non-aqueous solvents.

Paper XI (Physical Chemistry)

1. To study the basic terms and laws- Henry law, Raoults law in phase equilibrium and phase rule.
2. To understand different systems- Water, Pb-Ag, Mg-Zn, $FeCl_3$-H_2O, phenol-water, trimethyl amine - water, nicotine- water system, acetone-dry ice.
3. To understand the concept of ideal behavior and deviations from ideality.
4. To understand the concept of conductivity and its types, Kohlrausch's law, Arrhenius Theory of Electrolyte Dissociation, Ostwald's dilution law, Transport number: and its determination, Conductometric titrations.
5. To familiarize with types of reversible electrodes, Nernst Equation, Cell E.M.F., single electrode potential, Reference electrodes, Electro-chemical series, Electrolytic and galvanic cells, types of cells, Thermodynamic quantities of cell reactions, Concepts - pH, pKa and their determination, Buffers- types, and mechanism of action, Henderson-Hasselbalch equation. Corrosion: Concept, types and electrochemical theory.

B.Sc. V Semester

Paper XIII Physical Chemistry

1. To understand concepts in Quantum Mechanics - Black body radiation, Planck's radiation law, photoelectric effect, Bohr's modes of hydrogen atom, Compton Effect. De Broglie

Hypothesis, the Heisenberg's uncertainty principle, Harmiltonian operator, Schrödinger wave equation postulates of quantum mechanics. Schrödinger wave equation for H-atom.

2. To study the basics of spectroscopy - Electromagnetic radiation, regions of the spectrum, Born-Oppenheimer approximation, Rotational Spectrum - Diatomic molecules, energy levels of a rigid rotor (semi classical principles), selection rule, rotational spectra of rigid diatomic molecule, determination of bond length.
3. To understand photochemistry - Photochemical processes, laws of photochemistry, Grothus - Drapper law, Stark-Einstein law, Jablonsiki diagram qualitative description of fluorescence, phosphorescence, non- radiative processes, quantum yield and photosensitized reactions.
4. To study some physical properties and their relation with the assignment of molecular structure- Optical activity, dipole moment, magnetic property.
5. To introduce nano-materials - Properties, methods of synthesis and applications.

Paper XIV Organic Chemistry

1. To introduce organic spectroscopy - ^{1}H NMR, shielding and deshielding, chemical shifts, interpretation of PMR spectra of simple organic molecules, combined problems on UV, IR and PMR spectroscopic techniques.
2. To familiarize students with organometallic compounds - Structure, methods of synthesis and synthetic applications of Grignard reagents, Organozinc and organolithium compound.
3. To understand organic synthesis via enolates - Active methylene compounds, Claisen condensation, Acidity of alpha hydrogen and its synthetic applications.
4. To introduce Fats, oils and detergents - Saponification value, iodine value, and acid value. Detergents- preparation of sodium alkyl sulphonate, alkyl benzene sulphonate, and amide sulphonate, cleansing action of detergent.

B.Sc. VI Semester

Paper XVI Inorganic Chemistry

1. To understand nature metal-ligand bonding in transition metal complexes - crystal field theory with respect to octahedral, tetrahedral and square planer complex.
2. To familiarize with electronic spectra of transition metal complexes.
3. To introduce organo metallic compounds - classification, nomenclature, synthesis and reactions.
4. To study the roles and biological functions of metals in biological systems.
5. To introduce chromatography - types, classification and applications.

Paper No. XVII Organic Chemistry

1. Curriculum benefits to study the heterocyclic compounds in details, their aromatic characters and importance in medicinal chemistry, structure elucidation of five and six member heterocyclic compounds using molecular orbital theory.
2. It covers synthesis and properties of some five and six member heterocyclic compounds.
3. It helps to study carbohydrates chemistry and their importance.
4. It covers synthesis and properties of some polymers, polymerization reactions.
5. It covers constitution, classification, synthesis and properties of some dyes.
6. It covers constitution, classification, synthesis, properties and applications of some drugs.

Computer Science (optional subject)

Computer Fundamental

Course code: CSO1

1. Make the students familiar with Computer environment.
2. Familiarize with the basics of Operating System and business communication tools.
3. Identify the parts of the computer system.
4. Adequately explain functioning of computer components.
5. Explain the process of problem solving using computer
6. Design an algorithmic solution for a given problem

1.2 Digital Electronics:

Course code: CSO2

1. Get familiar with concepts of digital electronics
2. Learn number systems and their representation
3. Understand basic logic gates, Boolean algebra and K-maps
4. Study arithmetic circuits, combinational circuits and sequential circuits
5. Study comparative aspects of logic families.

Operating System (CSO4)

1. To understand functions, structures and history of operating systems.
2. To understand design issues associated with operating systems.
3. To understand process management concepts including scheduling, synchronization, and deadlocks.
4. To familiarize with multithreading.
5. To study master concepts of memory management including virtual memory.
6. To understand master system resources sharing among the users.
7. To study issues related to file system interface and implementation, disk management.
8. To familiarize with protection and security mechanisms.

Programming in C (CSO5):

1. To make the student learn a programming language.
2. To learn problem solving techniques.
3. To teach the student to write programs in C and to solve the problems.
4. Read, understand and trace the execution of programs written in C language.
5. Write the C code for a given algorithm.
6. Implement Programs with arrays and functions.

Course code: CS07: Advance C-Programming.

1. Understanding about to create user defined functions for specific task in c language.
2. Understanding about functions and its types and working.
3. Understanding use of user defined data types such as structures & unions.
4. Students will capable of dealing with memory using pointers.
5. Information about library functions and storage classes in c language.
6. Knowledge about preprocessor directives and different operators used in c language.
7. Dealing with Files stored on computer memory using File handling.

Course code: CS08 - Data Structure:

1. Student will be able to choose appropriate data structure as applied to specified problem definition.
2. Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
3. Students will be able to apply concepts learned in various domains like DBMS, compiler construction etc.
4. Students will be able to use linear and non-linear data structures like stacks, queues, linked list etc.

Course Code: CS011 - Programming in CPP:

1. To understand basic object oriented concepts and the issues involved in effective class design.
2. To write C++ programs that use object oriented concepts such as information hiding, constructors, destructors, inheritance etc.

Course Code: CS012 - DBMS Using SQL:

1. To know about database system basic concepts, architecture, features, purpose, advantage of DBMS.
2. Learning about Component of a DBMS: Users, Facilities & Structure.
3. Learning about Data Modeling & Design.
4. Learning about Entity-Relationship Data Model.
5. Understanding about basics of relational model, normalization, relational algebra.
6. Introduction to oracle s/w.
7. Student will able to deal with database system using SQL to manipulate data.
8. Information about physical storage of data.
9. Knowledge about architecture of database system.
10. Learning about transaction processing and concurrency control.

CSO15- Software Engineering:

1. To manage the selection and initiation of individual projects and of portfolios of projects in the enterprise.
2. To conduct project planning activities that accurately forecast project costs, timelines, and quality.
3. To implement processes for successful resource, communication, and risk and change management.
4. To demonstrate effective project execution and control techniques that result in successful projects.
5. To conduct project closure activities and obtain formal project acceptance.
6. To demonstrate a strong working knowledge of ethics and professional responsibility.
7. To demonstrate effective organizational leadership and change skills for managing projects, project teams, and stakeholders.

CSO16-VB .Net:

1. To understand the structure and model of the programming language VB .Net
2. To use the programming language VB .Net for various programming technologies.
3. To develop software in VB .Net.
4. To evaluate user requirements for software functionality required to decide whether the programming language VB .Net can meet user requirements.
5. Propose the use of certain technologies by implementing them in the VB .Net programming language to solve the given problem.
6. To choose an engineering approach to solving problems, starting from the acquired knowledge of programming and knowledge of operating systems.

CSO19 -Data Communication and Networking:

1. Understand different types of networks, various topologies and application of networks.
2. Understand types of addresses, data communication.
3. Understand the concept of networking models, protocols, functionality of each layer.
4. Learn basic networking hardware and tools.
5. Understand wired and wireless networks, its types, functionality of layer.

CSO20- Ethics and Cyber Law:

1. To describe laws governing cyberspace and analyze the role of Internet Governance in framing policies for Internet security.
2. To discuss different types of cybercrimes and analyze legal frameworks of different countries to deal with these cybercrimes.
3. To explain the importance of jurisdictional boundaries and identify the measures to overcome cross jurisdictional cyber-crimes.
4. To illustrate the importance of ethics in legal profession and determine the appropriate ethical and legal behavior according to legal frameworks.
5. To identify intellectual property right issues in the cyberspace and design strategies to protect your intellectual property.

6. To assess the legal issues with online trading, and analyze applicable e-contracting and taxation regulations.
7. To create security policy to comply with laws governing privacy and develop the policies to ensure secure communication

---

B.Sc. Electronics

Semester-I

ELE 101 [NETWORK THEOREMS AND SEMICONDUCTOR DEVICES]

1. To make students learn and understand the various electronic passive and active components
2. To understand basics of P-N Junction Diodes and their types
3. To understand basics of transistor JFETS and their working
4. To understand basics of Power supplies using semiconductor diodes and IC's.

ELE 102[DIGITAL ELECTRONICS – I]

1:- To understand basics of number systems, Binary, Octal, Hexadecimal etc
2:- To learn basics of Logic Gates and their working Symbols
3:- To understand basics of Boolean algebra and Theorems
4:- To learn basics of Combinational Logic Circuits and their applications.

Semester-II

ELE 201 [AMPLIFIERS]

1:- To understand the different types of Biasing Techniques of Transistor.
2:- To understand the 2- port Technique of analysis of Transistor Amplifier.
3:- To understand the Feed Back technique of study of transistor Amplifier.
4:- To understand the Different types of Power Amplifiers and their working.

ELE 202[DIGITAL ELECTRONICS - II]

1:- To understand the basics of Flip-Flops their Types and their Working.
2:- To understand the working of Counters and their Types and Uses.
3:- To understand the basics of Shift Registers, their types and their applications.
4:- To understand the different types of Memories used to store the Data, their working.
5:- To understand the different types of converters used to transfer the digital data in Analog form.

ELE 301 [LINEAR INTEGRATED CIRCUITS]

1:- To make students learn and understand the working of OP-AMP Integrated Amplifier system.
2:- To make students learn and understand the Various Applications of OP-AMP.
3:- To make students learn and understand the working of Oscillators used in Electronic Generators.
4:- To make students learn and understand the working of Timer IC 555 and its applications.

142 ELE 302 [8086 MICROPROCESSOR]

1:- To understand basics of 8086 Microprocessor.
2:- To make students learn and understand the instruction Set of 80806 microprocessor.
3:- To make students learn and understand the Assembly Language Programming.

Semester-IV ELE 401 [COMMUNICATION ELECTRONICS]

1:- To make students learn and understand the different types of Modulation Techniques.
2:- To make students learn and understand the Pulse Modulation Techniques.
3:- To make students learn and understand the different ways of Modulation and Detection.
4:- To make students learn and understand the Digital Communication Techniques.

ELE 402 [8086 MICROPROCESSOR INTERFACING]

1:- To make students learn and understand the interfacing of Memories and I/O.
2:- To make students learn and understand the programming using IC 8255.
3:- To make students learn and understand the Communication Interface using IC 8251.
4:- To make students learn and understand the Programmable interval Timer IC 8253.

Semester-V Ele 501: Power Electronics

1. Knowledge of Power components and their characteristics
2. Understand the concept of electronic sensors.
3. Get the knowledge of different types of electronic sensors
4. Application of sensors for detection of an object
5. Get the idea of Industrial motors and power requirement
6. Understand the concept of industrial motor speed control and methods

Ele 502(A): Microcontroller –I

1. Get the concept of embedded systems
2. Understand difference between microprocessor and microcontroller
3. Fundamental knowledge of microcontroller
4. Knowledge of microcontroller hardware specific to 8051 microcontroller
5. Knowledge of microcontroller instructions
6. Understand applications of Microcontroller in different fields.

143 Semester-VI Ele 601(A): Programmable Logic Controller

1. Get the concept of industrial controls
2. Understand Relay logic concept
3. Understand ladder logic concept
4. Knowledge of basic PLC system
5. Understand PLC instructions
6. Develop ladder logic for specific industrial control system.

Ele602 (A): Microcontroller – II

1. Get detail knowledge of microcontroller internal blocks
2. Knowledge of Timer and counter block and its programming
3. Knowledge of Serial communication and its programming
4. Understand interrupts and its programming
5. Concept and programming to LCD, ADC and DAC to microcontroller
6. Application of microcontroller in various domains

Fishery Science

Semester I

Morphology and taxonomy of fish:

External characters of fishes and morphology of fins, Origin and evolution of fish, Epidermis and exoskeleton, General Characters, Identification and systematic position of fishes. Broad outline of classification of fishes, Salient Feature and affinities in different groups of fishes.

Anatomy and Physiology:

Students are able to know Axial Skeleton, Visceral and appendicular skeleton., Alimentary canal and associated digestive glands, physiology and digestion. Structure and function of gill, Physiology of respiration, accessory respiratory organs, Structure and function of heart, Arterial and Venous system, Blood and its components. Structure and its function of Kidney osmoregulation. Male and Female Reproductive Organs, Maturation and spawning. Structure of Brain, Cranial Nerves and Spinal nerves. Endocrine glands in Fishes ,Structure and function of Pituitary gland and Thyroid gland.

Semester II

Fish Ecology and Adaptation

Students get acquainted with Ecology, Ecology of fresh water, Ecology of Brackish and Marine Water.
They get knowledge of Water Pollution, Migration of Fishes, adaptations of Fishes to Environment, adaptation in the Hill stream fishes, adaptation in Deep Sea fishes, adaptation in Exotic Fishes.

Fish Pathology and Parasitology

Students aware about Inflammation and immune response and pathological changes in tissues., Sings of sickness and effect on fish and mode of contractions of infection.

They get practical information about Disease caused by parasites and pathogens and its control measures., Fungal Diseases, Bacterial Diseases, Protozoan Diseases., Worm Diseases., Crustacean Diseases**.**

SemesterV

Fish economics:

To create awareness in students about Economic terminology and functions of economic system

To get acquainted with demand and supply of fish. Traditional and modern fish marketing.

Modern trends in fishery science:

To aware students about Principles of fish genetics and biotechnology, hybridization, chromosomal engineering etc.

SemesterVI

Fish statistics, management and extension:

Application of statistical methods, data collection, processing is learned by students. Students get aware about Cooperative societies of fishermen, management of it, economic condition of fishermen .

Modern trends in fishery science II:

Students study immunology and it details in fish, microbiology of fish, Contamination, Preservation and different aspects of spoilage of fish**.**

Mathematics

Differential Equations

1. To understand the homogeneous and separable first order differential equations.
2. To understand the exact differential equations.
3. To understand homogenous linear equation with constant coefficient and variable coefficient
4. To find the solution of non-homogenous first order differential equations.
5. To find the solution of Bernoulli's equation.

Geometry

1. To understand geometrical terminology for plane, right line, sphere, cylinder and cone.
2. To know the geometrical results to find centre and radius of the circle.
3. Students find equation of lines and planes in space.
4. Student will be able to find angle between two planes and to find length of perpendicular from a given point to a given line.
5. Students are able to identify parallel and perpendicular lines.

Differential and Integral Calculus

1. Students develop the concepts of limit, function, continuity, discontinuity and derivative.
2. Students become familiar with hyperbolic functions, inverse hyperbolic functions, derivatives, and higher order differentiation.
3. Students understand the consequences of Rolle's Theorem and mean value theorem for differentiable function.
4. Student understands definite integral as the limit of a sum.
5. Student will be able to understand the concept of divergence, curl, gradient and it's applications.

Number Theory

1. Students are able to find quotient and remainders from integer division.

2. Students apply Euclid's algorithm and Backward substitutions.
3. Students understand the concept of Congruences, residue classes and least residue.
4. Student knows the concepts addition and multiplication of integers modulo n.
5. Students are able to solve linear congruences.

Numerical Methods.

1. Student becomes familiar with numerical solutions of nonlinear equations in a single variable.
2. Students know the concepts numerical interpolation and approximation of functions.
3. Student solve first order initial value problem using Euler's method.
4. Student solve first order initial value problem using a second order Runge- Kutta Method.
5. Students are able to find numerical solution of ordinary differential equations.

Integral Transform and Partial differential Equations

1. Students understand the concept of beta and gamma function and its application.
2. Students are able use to Laplace transform to solve ordinary and partial differential equation.
3. Students apply the properties of Laplace Transform to solve examples.
4. Students know the difference between linear and nonlinear partial differential equations.
5. Student able to solve the linear and nonlinear partial differential equation by various methods like Lagrange's, Carpet's, Jacobi's, Monge's Method.

Mechanics (I & II)

1. Students understand the concepts particle, rigid body, force, equilibrium etc.
2. Students can find the components of velocity and acceleration in a given direction.
3. Students follow the concepts momentum, angular momentum, work, energy and points functions in mechanics.
4. Students know what is projectile and motion of projectile.
5. Students know the differential and pedal equations of central orbits and their applications

Abstract Algebra (I & II)

1. Students understand the number systems and algebraic structures.
2. Students understand the concept Ring and special types of Rings.
3. Students identify the difference between homomorphism and isomorphism of a group.
4. Students know and apply the concepts of linear dependence and linear independence of vectors.
5. Students are able to give the examples of inner product space.

Statistics I & II

1. Students know the difference between Mean Mode and Median.
2. Students are able to trace different graphs.
3. Students understand the frequency distribution.
4. Students know the concept of probability theory.

Real Analysis (I & II)

1. Students become familiar with terminology sets, elements, operations on sets, functions, operations on functions.
2. Students are able to define and recognize the basic properties of the field of real numbers.
3. Students are able to understand the concept of series of real numbers, convergence and Divergence.

4. Students are able to understand the definition of Metric Space and continuous function on metric space
and difference between open sets and closed sets.
5. Students are able to define Riemann integral and its properties and also Fourier Series and its application

---

Physics

F.Y. B. Sc. Semester I

Paper I –Mechanics, Properties of Matter

Upon completion of the course, the students will be able to:
CO1: Summarize Newton's law of gravitation, gravitational potential and fields
CO2: Discuss basic properties of matter and elastic constants
CO3: Discuss properties of matter such as viscosity, surface tension
CO4: Define acoustics intensity, loudness, reverberation etc.

Paper II- Heat & Thermodynamics

Upon completion of the course, the students will be able to:
CO1: Define Thermal Conductivity, diffusivity, resistivity and its comparison for metals
CO2: Understand modified gas equation, critical constants
CO3: Explain Transport phenomenon, mean free path, conductivity and viscosity of gas
CO4: Understand thermodynamic processes, Heat engine Maxwell's equations

F. Y. B. Sc. Semester II

Paper-IV Geometrical and Physical Optics

Upon completion of the course, the students will be able to:
CO1: Describe cardinal points of coaxial lens systems and different eye pieces
CO2: Explain interference of light and its relevant experiments
CO3: Explain concept of diffraction of light, grating
CO4: Describe polarization of light, optical activity

Paper V- Electricity & Magnetism

Upon completion of the course, the students will be able to:
CO1: Use principles in vector algebra to solve problems in electrostatics
CO2: Explain Coulomb's law, Gauss law
CO3: Explain the concept of Biot-Savrat's Law, Ampere‟s Law
CO4: Understand growth and decay current in LCR circuit

S.Y. B. Sc. Semester III

Paper VII- Mathematical Physics and Relativity

Upon completion of the course, the students will be able to:
CO1: Explain different types of differentiation
CO2: Describe ordinary differential equation and its solutions
CO3: Understand theories of statistical Physics, quantum statics
CO4: Have brief idea about special theory of relativity

Paper VIII- Modern Physics

Upon completion of the course, the students will be able to:

CO1: Explain Photoelectric effect and its applications

CO2: Describe X- Ray radiation and its spectra

CO3: Explain, Atomic mass, nuclear fission and Energy released

CO4: Describe Particle accelerators

S.Y. B. Sc. Semester IV

Paper XI- General Electronics

Upon completion of the course, the students will be able to:

CO1: Explain theory of semiconductor, Diodes, Transistors, its working and applications

CO2: Understand the need of transistor biasing, amplification etc.

CO3: Describe transistorized oscillators and Multi-vibrators

CO4: Elaborate types of modulation and its theories

Paper XII- Solid State Physics

Upon completion of the course, the students will be able to:

CO1: Explain different types of Crystal structures

CO2: Elaborate Kronig Penney Model

CO3: Describe theories of lattice heat capacity

CO4: Understand free electron theory of Metals, Hall Effect and its importance

CO5: Describe transport properties solids, electrical and thermal conductivity

T.Y. B. Sc. Semester V

Paper XV- Classical and Quantum Mechanics

Upon completion of the course, the students will be able to:

CO1: Have insight in basic concept of Classical Mechanics

CO2: Explain Lagrange's equation, its applications

CO3: Explain basics of constraints, Virtual work done

CO4: Discuss mathematical basis of quantum mechanics

CO5- Derive Schrodinger equations, its applications

Paper XVI- Electrodynamics

Upon completion of the course, the students will be able to:

CO1: Describe fundamental concepts in Electrostatics

CO2: Explain concepts of self and mutual induction, equation of continuity

CO3: Describe Maxwell's equations in conducting media

CO4: Describe electromagnetic wave equation in conducting media

CO5: Explain electromagnetic energy and its interaction with matter

T. Y. B. Sc. Semester VI

Paper XIX- Atomic, Molecular Physics & LASER

Upon completion of the course, the students will be able to:

CO1: Explain in depth different atomic models

CO2: Explain quantum numbers, Coupling Scheme and Pauli's exclusion principle
CO3: Explain Zeeman Effect and Stark effect
CO4: Describe Rotational and Vibration Spectra, Raman Effect, its applications
CO5: Discuss LASER systems, its properties and applications

Paper XX- Non-conventional Energy Sources and Optical Fiber

Upon completion of the course, the students will be able to:
CO1: Describe Conventional and non-conventional energy sources
CO2: Describe concepts of solar energy, its applications and Solar cells
CO3: Describe different types of optical fibers, its characteristics
CO4: Understand fabrication methods of optical fibers, testing of OFCs

---

Zoology

Protozoa to Annelida

1. To create awareness about fundamental invertebrate animals in nature and their classification as phylum system anatomy and development.

2. To equip the students with all life science fundamental practical skills.

Cell biology I

1. To understand the important terminology structure and function important Cell organelles in animal cell.
2. To study cell structure, process of cell division.

Arthropoda to Echinodermata & Protochordate

1. To introduce the students to higher invertebrates, morphological features, evolutionary development and connecting links and adaptations.
2. To analyze the peculiar characteristics of animal groups in relation with its internal characteristics.

Genetics-I

1. To understand some important terminology in Genetics, Laws, & its applications
2. To observe and calculate probabilities in cross, heredity and variations in .

Vertebrate Zoology

1. To familiarize with basic terminology, Animal systematics and its different Classification, Anatomy and development.
2. To understand classification, morphological structures, identification of specimens and anatomy of some animals, embryological process of development

Genetics-II

1. To create awareness of mechanism of protein synthesis, DNA fingerprinting, Recombinant DNA technology, various methods employed for rDNA.
2. To understand mechanism of protein synthesis, problems on genetics.

Animal physiology

1. To study different animal processes
2. To understand life processes through experiments.

Biochemistry & Endocrinology

1. To focus on biochemical processes, metabolism and catabolism process.
2. To inculcate the knowledge for advance study in biochemical reactions, analysis instruments principle & use.

Ecology

1. To study basic terms and subject application in life Sciences
2. To understand the basic information of types of ecosystems, role of living things in ecosystems, deals with basic ecological concepts.
3. To analyze biotic and abiotic factors, animal interactions etc.

Entomology-I

1. To familiarize with basic terminology of insects, biodiversity of insect, its classification and general characters.
2. To understand morphology, economic importance and anatomy of insects.
3. To understand useful insect and their role in agrobased industry.
4. Students can participate in field collection and their identification to understand insect ecology.

Evolution

1. To study basic terms and subject application in life Sciences.
2. To participate in laboratory experiments for understanding the basic principles of evolution through models and helpful for gaining primary information.

Entomology-II

1. To understand the useful and harmful insect.
2. To familiarize students with basic terminology and damage caused by pest.
3. To identify and classify insect pest and their life cycle for managements.
4. To know the plant protection appliances and its application.

B.Sc. Biotechnology

Biochemistry: Biochemistry or biological chemistry, is the study of chemical processes within and relating to living organisms. Biochemical processes give rise to the complexity of life. It describes the chemistry of carbohydrates, lipid, protein and nucleic acids with their detailed classification. Structures and mechanism of enzyme action.

Proteomics and Genomics: Proteomics is the large-scale study of proteins. Proteins are vital parts of living organisms, with many functions. Genomics is an interdisciplinary field of biology focusing on the structure, function, evolution, mapping, and editing of genomes. A genome is an organism's complete set of DNAs, including all of its genes.

Inheritance biology/ Genetics: Genetics is a branch of biology concerned with the study of genes, genetic variation, and heredity in organisms. Basically, how the important characters are transfer from one generation to the next one.

Genetic Engineering/ Recombinant DNA Technology[RDT]: Genetic engineering, also called genetic modification or genetic manipulation, is the direct manipulation of an organism's genes using biotechnology. It is a set of technologies used to change the genetic makeup of cells, including the transfer of genes within and across species boundaries to produce improved or novel organisms.

Cell biology/Cytology: It is branch of biology concern with study of cell and their basic structural, functional details. As cell is biological unit of all known organisms. A cell is the smallest unit of life. Cells are often called the "building blocks of life".

Immunology: Immunology is a branch of biology that covers the study of immune systems in all organisms. Immunology charts, measures, the physiological functioning of the immune system in states of both health and diseases; malfunctions of the immune system in immunological disorders and the physical, chemical, and physiological characteristics of the components of the immune system in vitro, in situ, and in vivo.

Fundamental biology/ Molecular biology: It is field of science concerned with studying the chemical structures and processes of biological phenomena that involve the basic units of life. The field of molecular biology is focused especially on nucleic acids (e.g., DNA and RNA) and proteins macromolecules that are essential to life processes and how these molecules interact and behave within cells.

Plant physiology: Plant physiology is a subdiscipline of botany concerned with the functioning, or physiology, of plants. Closely related fields include plant morphology (structure of plants), plant ecology (interactions with the environment), phytochemistry (biochemistry of plants), cell biology, genetics, biophysics and molecular biology. Fundamental processes such as photosynthesis, respiration, plant nutrition, plant hormone functions, tropisms, nastic movements, photoperiodism, photomorphogenesis, circadian rhythms, environmental stress physiology, seed germination, dormancy and stomata function and transpiration, both parts of plant water relations, are studied by plant physiologists.

Animal physiology: Animal physiology is the branch of biology in which study of the internal physical and chemical functions of animals. It is subdiscipline of zoology. Professionals in this field may explore the makeup of animals, including their genetics, their behaviours and their biological structure.

B.Sc. [Computer Science]

B.Sc. [CS] Semester-I CS101-T -Computer Fundamentals:

1. To introduce to computer.
2. To write algorithms and to draw flowcharts which are the first step towards the computer programming.
3. Students will get the knowledge of history of computer and types of computer.

4. Students will get the idea of types of different programming languages.
5. Students will introduce with types of memory and storage devices.
6. Students will get information of different input and output devices.
7. Students will also get the knowledge about Operating System, its types and basic features.

CS102-T - Digital Electronics:

1. Students will also get the knowledge of computer number system, its arithmetic operation, and Boolean algebra and logicgates.
2. Students will learn k-maps and the Combinational and Arithmetic LogicCircuits.
3. Students will get the information of Flip-flops, Counters, registers, their types andfunctions.

CS103-T - Microprocessor:

1. To introduce to Microprocessor and Microcomputer and 8086 Hardwarespecification.
2. Students will learn the working of 8086microprocessor.
3. To learn different addressing modes of8086.
4. To learn instruction set and will able to write programs on 8086kit.

CS104-T - 'C' Programming - I:

1. Students will get the introduction of C-programminglanguage.
2. Students will also get the knowledge of C-character set and basic elements and operators used in C- programming.
3. Students will learn the data types of C and input/outputstatements.
4. Students will be able to write the programs usingc-language.
5. Students will learn the use of control statements within program and the use ofarray.

CS105-T - Communication Skill –1:

1. Students will get the importance of communication and the elements ofcommunication.
2. Students will also get the knowledge of types and methods ofcommunication.
3. Students will able to communicate in Englishproperly.
4. Students will learn English grammar and vocabularybuilding.
5. Students will able to give speeches and presentation inEnglish.
6. To acquaint practice to read, write and speak inEnglish.

CS106-T - Mathematical Foundation:

1. Students will learn Set theory which will be helpful for the higherstudies.
2. Students will also learn graphtheory.
3. To get information about different types of binary relations andFunctions.
4. Students will also learn Booleanalgebra

CS107-P - Practical based on Office Suite:

1. Students will able to use computer like start, open or search a file, shutdown the computer,etc.
2. Students will also able to useinternet.
3. To demonstrate the mechanics and uses of Word tables to organize and presentdata.
4. TodemonstrateworkingknowledgeofusingWord'sthemesandcliparttocreateavarietyofvisualeffects.
5. To demonstrate working knowledge of Word's advanced formatting techniques and presentationstyles.
6. To demonstrate applicable knowledge and uses of accepted business style formattingconventions.
7. To learn to create documents using Microsoft word this will be useful for writing applications, letters and office use.
8. To create and design a spreadsheet for general officeuse.
9. To enable students to give their presentations usingcomputer.

CS108-P - Practical based on Digitalelectronics:

1. To describe how analog signals are used to represent digital values in different logic families, including characterization of the noisemargins.
2. To create the appropriate truth table from a description of a combinational logicfunction.
3. To create a gate-level implementation of a combinational logic function described by a truth table using and/or/ingates.
4. To evaluate combinational and sequential logic designs using variousmetrics.

CS109-P - Practical based on Micro Processor - I:

A student will be able to

1. Intel 8086 microprocessor architecture and real mode memoryaddressing.
2. Intel microprocessor addressingmodes.
3. Assembly language programming anddebugging.
4. Arithmetic calculations using 8086 microprocessorkit.
5. Transfer of data and exchange of data between various memoryunits.

CS110-P- Practical based on 'C' Programming:

1. To understand the fundamentals of Cprogramming.
2. To choose the loops and decision making statements to solve theproblem.
3. To implement different Operations onarrays.
4. To understand basic mathematicalcalculations.

B.Sc. [CS] Semester-II

CS201-T- Data Structure:

1. Students will get the information about basics of Datastructure.
2. Students will learn the use of arrays in datastructure.
3. Students will get the knowledge of working of linked list, stacks andqueues.

CS202-T- Operating System:

1. Students will learn the working of OperatingSystem.
2. Will get the information that how the processes are managed by operatingsystem.
3. Will also learn the storage and devicemanagement.
4. Students will study the file structure managed by operatingsystem.

CS203-T-Micro Processor – II:

1. Students will learn the logic and control instructions of8086.
2. Students will get the knowledge of modular programming, assembler, linker andmacros.
3. Also will learn interrupts, their types, DMA and DMA controlI/O.

CS204-T- 'C' Programming – II

1. Students will learn how to write user definedfunctions.
2. Will able to use structures and union within c programs to have a user defined datatype.
3. Students will able to use pointers within program to access the computer memory locationdirectly.
4. Students will learn to use preprocessor directives and miscellaneousfeatures.
5. Will also able to work on files usingc-programs.

CS205-T- Communication Skill-II

1. Students will learn to write Letters, Notices, Minutes, Manual, Leaflet, Complaints& Suggestion and Job Application.
2. Will also able to writereports.
3. Will able to do groupdiscussions.
4. Student will learn to write their CV forinterview.
5. Students will learn how to prepare forinterview.

CS206-T - Numerical Computation Methods:

1. Students will get the knowledge of types of errors inmathematics.

2. To understand the matrix anddeterminants
3. Students will able to get the roots of linear and nonlinear equations using differentmethods.
4. To learn the interpolation and regressionmethods.

CS207-P-Practical based on Data Structure:

1. Understand the concept of Dynamic memory management, data types, algorithms, Big Onotation.
2. Understand basic data structures such as arrays, linked lists, stacks andqueues.
3. Describe the hash function and concepts of collision and its resolutionmethods.
4. Solve problem involving graphs, trees andheaps.
5. Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data.

CS208-P-Practical based on Micro Processor – II:

1. Students will learn to implement arithmetic operations on 8-bitnumbers.
2. Students will learn to write 8086 program to find smallest/largestnumber.
3. Students will learn to write 8086 program for sum of array elements, reverse of arrayelements.
4. Students will able to do more complicated programs over8086.

CS209-P- Practical based on C Programming-II:

A student will

1. Implement Programs with pointers and arrays, perform pointer arithmetic, and use thepre-processor.
2. Write programs that perform operations using derived datatypes.
3. Use of pointers and user defined datatypes.
4. Use of functions used in Clanguage.

CS210-P- Practical based on Numerical Computational Method:

A student will

1. Identify different mathematical problems and reformulate them in a way that is appropriate for numerical treatment.
2. Choose appropriate numerical method for treatment of the givenproblem.
3. Explain choice of method by accounting for advantages andlimitations.
4. Chooseanalgorithmthatimpliesefficientcalculationsandimplementitinaprogramminglanguage,suited for calculations e.g.C-language.
5. Estimate the reliability of theresults.
6. Use functions from the programming language library for efficient calculations

andvisualization.

7. Apply computer science for the solution of practicalproblems.

B.Sc.[CS] Semester-III

Advance Data Structure (CS301-T)

1. Students will get information and use of graphtheory.
2. Students will learn different sortingtechniques.
3. Students will learn different searchingtechniques.

Unix Operating System (CS302-T)

1. Students will get the basic information of UNIX operatingsystem.
2. Will learn the basic commands to work on UNIX operatingsystem.
3. Students will able to create and use files on UNIX operatingsystem.
4. Students will also learn shell script by which they will able to do programming onUNIX.

PC Maintenance (CS303-T)

1. Students will learn computer hardware and itsmaintenance.
2. Students will also learn s/w installations for PC and itssettings.
3. Students will get the knowledge of networking, settings and antivirusinstallation.
4. Students will get information of laptop and itscomponents.

Programming in CPP (CS304-T)

1. Acquire an understanding of basic object-oriented concepts of object oriented programming which is very important for softwaredevelopment.
2. Students will learn history and structure of C++ language and functions inC++.
3. Students will also learn use of class, object and friendfunction.
4. Students will able to do program in C++ to solve the real world problem using class andobjects.
5. Students also learn to use constructors, destructors and operatoroverloading.

Database management System (CS305-T)

1. To know about database system basic concepts, architecture, features, purpose, advantage ofDBMS.
2. To learn about Component of a DBMS: Users, Facilities &Structure.
3. To learn about Data Modeling &Design.
4. To learn about Entity-Relationship DataModel.

5. To understanding about basics of relational model, normalization, relationalalgebra.
6. To introduce to oracles/w.

Statistical methods (CS306-T)

1. Preparation for competitiveexaminations.
2. To know application of statistics in reallife.
3. To understand and to calculate various types of averages andvariations.
4. To apply discrete and continuous probability distributions to various businessproblems.
5. Students will learn how to organize, manage, and presentdata.
6. Students will do exercises or small projects that incorporate datapresentation.
7. Studentswillbeabletowritereportsontheresultsofstatisticalanalysis,givingsummariesandconclusions using nontechnical language.

Practical based on data structure using CPP. (CS307-P)

1. Students will implement different sorting techniques usingC-language.
2. Students will implement different searching techniques usingC-language.

Practical based on DBMS (CS307-P)

1. To explain the features of database managementsystems.
2. Students will be able to draw a schema for theirdatabase.
3. To design conceptual models of a database using ERmodeling.
4. To understanding about basics of relational model, normalization, relationalalgebra.
5. To introduce to oracles/w.

Practical based on PC Maintenance (CS308-P)

1. Practical study of computer hardware,motherboard.
2. To learn to connect input, output and storagedevices.
3. To understand installation of software's onPC.
4. To learn the technique to format hard disk, crating partitions onHD.
5. To study installation of device drivers andantivirus.

Practical based on UNIX (CS308-P)

1. To learn to work on Unix OperatingSystem.
2. Students will be able to execute various commands of UnixOS.
3. Students will be able to create and access files on UnixOS.

4. Students will be writing and execute shell script for Unix OS to get the desiredresult.

B.Sc. [CS] Semester-IV

Software Engineering(CS401-T)

1. Students will learn software developmentprocess.
2. Will learn different types of s/w that can bedeveloped
3. Study about different models ofs/w.

Fedora (CS402-T)

1. Introduction to fedora operatingsystem.
2. Learn basic commands of Linux and fedorainstallation.
3. Learn software package administration, user and groupadministration.
4. Learn File system and filepermissions.

Basics of Networking (CS403-T)

6. Learn different types of networks, various topologies and application ofnetworks.
7. Knowledge of different types of transmission media used for datacommunication.
8. Introduction to Mobile telephone system, generations and itsworking.

Core Java (CS404-T)

1. Implement Object Oriented ProgrammingConcepts.
2. Study of inheritance andinterfaces.
3. Student will Study system Packages and will able to create own package injava.
4. Implement exception handling inJava.
5. ImplementMultithreading.

Adv. DBMS (CS405-T)

1. Student will able to deal with database system using SQL to manipulatedata.
2. Information about physical storage ofdata.
3. Knowledge about architecture of databasesystem.
4. Learning about transaction processing and concurrencycontrol.

Web Fundamental (CS406-T)

1. Student will get knowledge about HTML, XHTML, HTML5 and itselements.
2. Will able to create static webpages.
3. Will learn java script to code program in webpage.
4. Will able to create dynamic web pages.

5. Study of CSS3 to design webpage.
6. Will able to design their web pages using cascaded stylesheets

Practical based on Java in fedora OS (CS407-P)

1. Knowledge of the structure and model of the Java programminglanguage.(Knowledge)
2. Use the Java programming language for various programming technologies(understanding)
3. Evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements(analysis)
4. Propose the use of certain technologies by implementing them in the Java programming language to solve the given problem(synthesis)
5. Chooseanengineeringapproachtosolvingproblems,startingfromtheacquiredknowledgeofpro gramming and knowledge of operating systems.(evaluation)
6. Able to create user defined packages and handle the errors also.

Practical based on Web Fundamentals (CS407-P)

1. Student will get knowledge about use higher level of HTML, CSS with the help of HTML5 andCSS3.
2. Student will able to validate web pages/ web sites as perrequirement.
3. Web application development using HTML forms and differentattributes.
4. Able to work with drag and drop eventhandling.
5. Able to use JavaScript inhtml.

Practical based on Adv. DBMS and N/W (CS408-P)

1. Define database system concepts and apply normalization to thedatabase.
2. Explain the basic processing and optimization techniques for high levelquery.
3. Describe different transaction processing concepts and use different concurrency controltechniques.
4. Discuss different types of databases such as object oriented and distributeddatabases.
5. Identify different types of database failures and techniques to recover from suchfailures.
6. Discuss advanced database technologies and products used inenterprise.

Practical based on Mini Project (CS408-P)

1. Formulate a real world problem and develop itsrequirements.
2. Develop a design solution for a set ofrequirements.

3. Test and validate the conformance of the developed prototype against the original requirements of the problem
4. Work as a responsible member and possibly a leader of a team in developing softwaresolutions.
5. Express technical and behavioral ideas and thought in oralsettings.
6. Prepare and conduct oralpresentations.

B.Sc. [CS] Semester-V

Software Cost Estimation (CS501-T)

1. StudentswilllearnsoftwarePlanningprocess,SoftwareScopeandFeasibility,TypesofResources,Project estimation.
2. Study of documentationtechniques
3. Study of estimation for different types ofmodels

Basic of Android O. S. (CS502-T)

1. Study of environmental setup for androiddevelopment.
2. Knowledge about application components used in androiddevelopment.
3. Learn the basic components of an Androidapplication.
4. Study of resource organization, filters and User Interfacecontrols.
5. Information of event handling inAndroid.
6. Describe the basics of graphics and multimedia support inAndroid.
7. Demonstrate basic skills of using an integrated development environment (Android Studio) and Android Software Development Kit (SDK) for implementing Androidapplications.
8. Demonstrate through a simple application the understanding of the basic concepts ofAndroid.

Core Java-II (CS503-T)

1. Knowledge about Input/output Stream used injava.
2. Learning different utilities in javalanguage.
3. An overview of database access and details for managing information using the JDBCAPI.
4. LearninghowtouseJavaappletstocreateinteractivewebprograms:Fonts,color,graphics,andanimation.
5. Learning how to use Java applets to create interactive web programs by sending and receiving parameters in an applet.

Basic of Computer Graphics (CS504-T)

1. Study of basic concepts of computergraphics.
2. Students will able to create graphics usingc-programming.
3. Information about 2Dtransformation.
4. Study of various algorithms to draw line andcircle.
5. Study of various character generationtechniques.

Beginners Programme with PHP (CS505-T)

1. Introduction toPHP.
2. Understand how server-side programming works on theweb.
3. PHP Basic syntax for variable, data types, Operators and Expressions andConstant.
4. Creating conditionalstructures.
5. Storing data inarrays.
6. Using PHP built-in functions and creating customfunctions.
7. Using class and objects inPHP.

Advanced Networking (CS508-T)

1. Study of OSI referencemodel.
2. Students will learn data link layer, data link controls andprotocols.
3. Study of Network layer and itsprotocols.
4. Study of Transport layer and applicationlayer.

Pr. Based on Adv. Java (CS509P -A)

1. Knowledge about Input/output Stream used injava.
2. Learning different utilities in javalanguage.
3. An overview of database access and details for managing information using the JDBCAPI.

Practical Based on Computer Graphics (CS509P -B)

1. Students will be familiar with graphical functions ofC-Language.
2. Implementation of 2D transformation translation, scaling, rotation of 2D object usingC-Language.
3. Implementation algorithms to draw line andcircle.

Practical Based on Android O.S. (CS510P -A)

1. Students will able to appreciate the Mobilitylandscape.
2. Students will able to design and develop mobile apps, using Android as development platform, with key focus on user experiencedesign.
3. Students will able to deal with native data handling and background tasks andnotifications.

4. Students will able to Appreciation of nuances such as native hardware play, location awareness, graphics, andmultimedia.
5. Students will able to Perform testing, signing, packaging and distribution of mobileapps

Practical Based on PHP (CS510P -B)

1. PHP Basic syntax for variable types andcalculations.
2. Creating conditionalstructures.
3. Storing data inarrays.
4. Using PHP built-in functions and creating customfunctions.

B.Sc. [CS] Semester-VI

Software Quality & Testing (CS601-T)

1. Information about software qualityconcepts.
2. Study of qualityassurance.
3. Study of software testing strategies, verifications,validations.
4. Will learn how to test conventionalapplication.
5. Will learn how to test webapplication.

Android Application Development (CS602-T)

1. Student will know about advanced features of AndroidSDK.
2. Student will familiar with Android DevelopmentTools.
3. Student will able to develop android apps with differenttools.
4. LearnhowtouseLocationServicesAPIstogetinformationaboutdevicelocation,receiveperiodicl ocation updates, and turn geographic coordinates into physicaladdresses.
5. Learn how to integrate Google Maps into your apps and use features like location markers, map styling, Street View, and locationtracking.
6. Learn about messaging services used by androidapps.
7. Learn Data Storage, Retrieval, andSharing.
8. Use of Bluetooth, Wi-Fi in androidapplications.

Theory of Computation (CS603-T)

1. Study of Sets, relations, functions, graphs, trees, mathematicalinduction.
2. Study of regularexpressions.
3. Students will also learn Finite automata, NFA,DFA.
4. Study of Formal Languages, classification of languages, their relation andautomaton.
5. Students will get the idea of how the programming languages aredeveloped.

Advanced Computer Graphics (CS604-T)

1. Study of 3DTransformation.
2. Students will get the knowledge of creation of Curves andFractals.
3. Basic Information of colormodels.
4. Basic Information of animation and animationcreation.

Advanced Prog. With PHP (CS605-T)

1. Handling HTML forms inPHP.
2. Maintaining state using cookies, session variables, hidden form fields and querystrings
3. Using PHP to manipulatefiles
4. Using database inPHP.
5. Using an object-oriented API to access SQL to SELECT, INSERT, UPDATE and DELETE data from tables.
6. Using MySQLfunctions.

Ethics and Cyber Law (CS608-T)

1. Information of scope of cyber laws, cyber jurisprudence and digitalcontracts.
2. Information of digitalsignature.
3. Describe laws governing cyberspace and analyze the role of Internet Governance in framing policies for Internetsecurity.
4. Discussdifferenttypesofcybercrimesandanalyzelegalframeworksofdifferentcountriestodeal withthese cybercrimes.
5. Explain the importance of jurisdictional boundaries and identify the measures to overcome cross jurisdictional cybercrimes.
6. Illustrate the importance of ethics in legal profession and determine the appropriate ethical and legal behavior according to legalframeworks.
7. Identify intellectual property right issues in the cyberspace and design strategies to protect your intellectual property.
8. Study of Information Technology Act 2000 CyberLaw

Practical Based on Android Development (CS609 P -A)

1. Student will know about advanced features of AndroidSDK.
2. Student will familiar with Android DevelopmentTools.
3. Student will able to develop android apps with differenttools.
4. LearnhowtouseLocationServicesAPIstogetinformationaboutdevicelocation,receiveperiodicl ocation updates, and turn geographic coordinates into physicaladdresses.
5. Learn how to integrate Google Maps into your apps and use features like location markers,

map styling, Street View, and locationtracking.

6. To learn about messaging services used by androidapps.

Practical Based on PHP (CS609 P -B)

1. To identify and handle the types of errors that can occur when programming withPHP
2. To introduce OOP (Object Oriented Programming) inPHP
3. To understand uses of object-oriented API to access to SELECT, INSERT, UPDATE and DELETE data fromtables.
4. Using MySQLdatabase.
5. Using OOP in PHP to define and useclasses.
6. Chooseanengineeringapproachtosolvingproblems,startingfromtheacquiredknowledgeofprogramming and knowledge of operating systems.(evaluation)

Major Project (CS610P)

1. To formulate a real world problem and develop itsrequirements.
2. To develop a design solution for a set ofrequirements.
3. To test and validate the conformance of the developed prototype against the original requirements of the problem.
4. To work as a responsible member and possibly a leader of a team in developing softwaresolutions.
5. To express technical and behavioral ideas and thought in oralsettings.
6. To participate in and possibly moderate, discussions that lead to making decisions.
7. To express technical ideas, strategies and methodologies in written form.
8. To prepare and conduct oral presentations.
9. Development of software.

M.Sc. Organic Chemistry

M.Sc. I Semester

CHE-101: Analytical Chemistry

1. To understand basic concepts in analytical chemistry - Role of analytical chemistry, qualitative and quantitative analysis, the analytical process, validation of a method.
2. To understand the methods of statistical treatment of analytical data.
3. To study the basic separation techniques in analytical chemistry.
4. To familiarize with different chromatographic techniques- theory, experimental and different parameters – TLC, column, liquid-liquid partition, gel permeation, ion exchange, gas and HPLC.

CHE-102: Inorganic Chemistry

1. To familiarize with different spectroscopic term symbols, Orgel diagrams and Tanabe Sugano diagrams for different configurations.
2. To understand the interpretation electronic spectra of metal complexes**.**
3. To study the preparations, reactions and structures of metal carbonyls and nitrosyls and EAN rule.
4. To understand the chemistry of dioxygen, dinitrogen complexes and non-carbonyl metal clusters.
5. To understand bioinorganic chemistry involved in biological systems.

CHE-103: Organic Chemistry

1. To study aromatic electrophilic and nucleophilic substitutions with reference to orientation and reactivity, energy profile diagram, ortho/para ratio, IPSO substitution, orientation in other ring system, Recapitulation of halogenation, nitration, sulphonation and Fridel Craft's reaction, diazonium coupling.
2. To understand nucleophilic substitution - S_NAr, S_N1, benzyne mechanism, Effect of substrate structure, leaving group and attacking nucleophile on reactivity.

4. To study reaction mechanism and reaction intermediates- carbocations, carbanions, free radicals.

3. To study Mechanism and stereochemical aspect of addition reaction involving electrophile, nucleophile and free radicals. Regioselectivity and chemo selectivity, orientation and reactivity in addition to carbon-carbon multiple bond; Michael addition, Sharpless asymmetric epoxidation.

5. Study of elimination and rearrangement reactions.

CHE-104: Physical Chemistry

1 . To understand ionic equilibria and biological reactions.

2. To study theories of reaction rates, kinetics of reactions, methods of determining rates of reactions.
3. To study deeply classical and statistical thermodynamics.
4. Concepts and models to understand surface chemistry.
5. To understand advanced concepts in electrochemistry.

M.Sc. II Semester

CHE-205: Spectroscopic methods of analysis

1. General introduction to spectral methods.
2. Basic concepts, instrumentation and applications of Microwave, Vibrational and Raman spectroscopy.

3. To understand the concept of photoelectron spectroscopy.
4. To study the thermal methods of analysis –TGA, DTA.
5. To understand the principles, instrumentation, applications of UV, IR and NMR spectroscopy.
6. To enable students for structure elucidation of compounds using combined spectral data.

CHE-206: Inorganic chemistry

1. To understand spectroscopic term symbols, microstates, Orgel diagram.
2. Study of electronic spectra and magnetic properties of transition metal complexes.
3. To understand the preparation, properties and reactions of metal carbonyls and nitrosyls.
4. Inorganic chemistry of hemoglobin and myoglobin.

CHE-207: Organic chemistry

1 To understand aliphatic and aromatic electrophilic as well as nucleophilic substitutions reactions.

2. Mechanisms and stereochemical aspects of addition to C-C double bonds and carbon-heteroatom multiple bonds.
3. To understand various named reactions with mechanisms.

CHE-208: Physical chemistry

1. To understands basics and advanced concepts in quantum mechanics.
2. To understand phase rule and its applications to different systems.
3. To study crystallography- law, symmetry elements, principles of crystal structure.

   To understand concepts in photochemistry, photochemical processes and mathematical equations

M.Sc. III Semester

CHEO-312 Structural elucidation by spectral methods

1. To understand spin-spin and different types of couplings.
2. To study principles and applications of mass and NMR Spectroscopy.
3. To study the basic principles and applications of Massbauer and ESR spectroscopy.
4. To understand structure elucidation of organic molecules by analysis of spectral data.

CHEO-313 Photochemistry, free radical and pericyclic reaction

1. To study the principles and applications of pericyclic reactions.
2. To understand electro cyclic reactions and their applications.
3. To study importance of cyclo addition reactions with examples.

4. To understand applications of photochemistry.
5. To understand free radical reactions.

CHEO-314 Asymmetric synthesis of and bio-organic chemistry

1. To understand classification and extraction of enzymes.
2. To introduce the students to enzyme as catalysts.
3. To study chemical structure of co- enzymes and cofactor.
4. To study chiral poll and Falkinanh model.

CHEO-315 Organic Synthesis

1. To study applications of different oxidizing reagents.
2. To study applications of various reducing reagents.
3. Synthesis and synthetic applications of of organic reagents applicable in synthetic organic chemistry.
4. To study carbon-carbon and carbon-heteroatom bond forming reactions.
5. Study of ylides and enamines.

M.Sc. IV Semester

CHEO-417 Organic Synthesis retro synthetic Approach

1. To study importance and applications of disconnection approach.
2. To understanding protecting groups for different functional groups in organic synthesis.
3. To study disconnection approach of cyclo addition reactions.
4. To study disconnection strategies for ring synthesis.
5. To understand retrosynthesis of complex organic molecules.

CHEO-418 Advanced organic and heterocyclic chemistry

1. To study structure, synthesis and reactions of mono and fused ring heterocyclic compounds.
2. To have deep understanding advanced name reactions or research level in synthetic organic chemistry.
3. To study rearrangement reaction and its application.
4. To study the nomenclature and classification of heterocyclic compounds.
5. To understand synthesis and reactions of simple mono as well as fused heterocyclic compounds.

CHEO-419 Chemistry of Natural product

1. To study terpenoids and carotenoids.
2. To understand chemistry of natural products and its applications.

3. To study sources, synthesis and applications of steroids.
4. To understand the biogenesis of natural products.

CHEO-420 Medicinal Chemistry

1. To understanding the classification of drugs.
2. To study synthesis and applications of antibiotics drugs in common medicines.
3. To understand the basic principles and applications of medicinal chemistry.
4. To study concepts in pharmacokinetics.
5. To understand synthetic pathways for the synthesis of common drugs.