Department of Computer Science

F.Y.BSc. SEM – I	F.Y.BSc. SEM – II
CS 101: Essential of Computer Science • Understand the History of Computers. • Understand What is Computer and Basic concepts of computer. • Aware about various types of Computers, types of I/O devices. • Preparation of Algorithm and Flowchart of Program. • Learn computer networks, its types and basics of Internet. • Understand computer viruses and its types. • Demonstrate basics Understanding Computer H/W & S/W. • Knowledge of Installation of Software. • Demonstrate basics understanding network Principle.	**CS 201: Internet Computing**
CS 102: C Programming-I • As it is Universal Language, after completion of this course students are able to solve any kind of problem in any field. • Understand the basic programming construct. • Learn function oriented programming concepts required in all other languages.	**CS 202: C Programming Language-II** • As it is Universal Language, after completion of this course students are able solve any kind of problem in any field. • Understand the basic programming construct. • Learn function oriented programming concepts required in all other languages.
CS 103: LAB • On completion of the course, students are able to develop programs using C to meet real world needs and able to develop their own websites. This course provides platform to • Enhance student's basic skills required for advanced programming.	**CS 203: LAB** • On completion of the course, students are able to develop programs using C to meet real world needs and able to develop their own websites. This course provides platform to • Enhance student's basic skills required for advanced programming.

Department of Computer Science

XXX

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV
COMP 211: Data Structure-I • Know what is data structure and basic algorithmic notations. • Analyze the time and space requirement of any algorithm. • Understand different linear data structures for conversion of mathematical expressions and polynomial representations. • Know the file structures.	**COMP 221 : Data Structure – II** • Know different non-linear data structures that can be used to represent hierarchical relationship between objects. • Traverse and represent the graphs in computer. • Understand the different approaches of sorting and searching elements in the arrays. • Understand different techniques of designing the algorithms.
COMP 212 : OOAD & Introduction to C++ • Be familiar with Object Oriented Programming Environment. • Differentiate between Structure oriented programming and object oriented programming. • Understand different object modelling techniques and analysis like Generalization , Aggregation and Metadata. • Write Reusable, Extensible and Robust programs in C++.	**COMP 222 : Programming in C++** • Explore polymorphism using Function and Operator Overloading. • Write programs for handling runtime errors using exception. • Understand the concepts of pointers in C++. • Understand the different aspects of hierarchy of classes and their extensibility. • Write generic programs using templates and STL.
COMP 213: Practical Course • On completion of the course, students are able to develop programs using C++ based on object oriented concepts and write the ROBUST, EXTENSIBLE and EFFICIENT programs.	**COMP 223 : Practical Course** • On completion of the course, students are able to develop programs using C++ based on object oriented concepts and write the ROBUST, EXTENSIBLE and EFFICIENT programs.

XXX

T.Y.BSc. SEM – V	T.Y.BSc. SEM – VI
CS-311 System Programming • Get aware about system software and their tools like Editors and Debug Monitors. • Get familiar with language processing activities. • Understand detail working of Assembler, Macro and Macro Preprocessor, Compiler and linker & Loader.	**CS-321 Operating System** • Know about functions and services of operating system. • Aware about different CPU scheduling algorithms • Get familiar with different memory management techniques. • Understand different disk and drum scheduling algorithms as well as deadlock concepts. • Get introductory knowledge about android operating system.
CS-312 Database Management System • Get aware of Describing & storing data. • Know about E-R Model by overview of database design.. • Get familiar with Conversion of ER to Relational model. • Know about functional dependency and Data Normalization. • Understand Database Implementations. • Make use of Concurrency control, Backup & recovery for large or huge of databases. • Get aware about handling huge databases.	**CS-322 MS SQL Server** • Understand features and data types in SQL server. • Create and manipulate databases for various applications. • Use procedures and trigger for performing complex operation on databases. • Handle errors using exception handling concepts.
CS-313 Software Engineering • Get aware of evaluation of software and Software Development Life Cycle (SDLC). • Know about Software Development Model.	**CS-323 Internet Programming using PHP** • Understand how PHP works with lexical structure of it. • Program for different applications using arrays, functions and strings. • Aware about different web techniques used in PHP.

T.Y.BSc. SEM – V	T.Y.BSc. SEM – VI
• Get knowledge of Requirement Analysis and Specification in software engineering . • Learn use of Fact finding Techniques , Types of Requirement Modeling and Data Modeling Concepts. • Get knowledge of Design Concepts in software engineering. • Know about Cohesion & Coupling , Decision Table & Decision Tree, Data flow Diagram • Know about Software Coding & Testing. • Get aware about Elements of Software Quality Assurance.	• Integrate PHP with MYSQL.
CS-314 Computer Aided Graphics • Differentiate between interactive and non interactive graphics. • Explore different line and circle drawing algorithms. • Perform 2D and 3D transformation on different images. • Know about detail working of image clipping and windowing. • Understand raster graphics and hidden surface elimination.	**CS-324 Theoretical Computer Science** • Understand what is Push down Automata and its applications. • Understand concepts of Context free grammar and normalization of CFG. • Convert regular expression to Finite Automata. • Design Turing Machines for various applications like enumerator, function computer and universal Turing machine.
CS-315 Programming in VB.NET • Get aware about .Net platform. • Understand looping structure, control flow statements and exception handling in VB.NET • Understand object oriented programming in VB.NET	**CS-325 Computer Network** • Understand applications of network, network structures and protocol hierarchy • Aware about details of physical, data link, network and transport layer of TCP/IP network model.

T.Y.BSc. SEM – V	T.Y.BSc. SEM – VI
• Program using ADO.NET	• Understand about different aspects of network security like firewalls, IP security and VPNs. • Aware about attacks and Confidentiality used in cryptography.
Elective-A CS-316 A) Programming in C# • By using c# code and ASP.Net create dynamic web pages. • Using MS Visual Studio.NET IDE and Create Console Applications. • Know about Basic Principal of OOP, Defining Class and using functions. • Able to use constructor and destructor. • Use Polymorphism ,Method Overriding ,Method hiding **Elective -B UG-CS-316 B) JAVA Programming-I** • Get knowledge JDK Environment. • Explore polymorphism using Function and Operator Overloading ,overriding . • Understand the different aspects of hierarchy of classes and their extensibility . • Understand the concepts of streams and files . Write programs for handling runtime errors using exception.	**Elective - A CS-326 A) Web Programming using ASP.NET** • Using features of ASP.Net create ASP.Net Compilation Model, Code behind Model Execution Stages. • Know about ASP.NET Controls , ASP.Net Intrinsic Objects • Use page layout, styles and text balance, site map, Master pages and content Pages, Navigation controls: Tree view, site map path(bread crumb), Menu navigation. • By using ASP.Net create dynamic web pages **Elective - B CS-326 B) JAVA Programming-II** • Program using graphical user interface with Swing classes. • Handle different kinds of events generated while handling windows. • Create programs using menus and dialog boxes. • Program for websites using applets. Understand advanced java concepts like JDBC and servlets.
CS-Lab-301 Lab on System Programming • On completion of the course, students are able to develop system	**CS-Lab-304 Lab on MS SQL Server** • On completion of the course, students are able to develop database

T.Y.BSc. SEM – V	T.Y.BSc. SEM – VI
programs to provide basic applications for computing like line editor, interrupt handler, SMAC0 and lexical • Analyzer.	management system using features and services provided by MS SQL Server
CS-Lab-302 Lab on Programming in VB.NET, Computer Aided Graphics • On completion of the course, students are able to develop different programs for demonstrating different Computer graphics algorithms like circle, line drawing and clipping and filling as well as students can create dynamic web pages using VB.NET.	**CS-Lab-305 Lab on Internet Programming using PHP** • On completion of the course, students are able to develop interactive static as well as dynamic websites.
Elective -A CS-Lab-303 A) Lab on Programming in C# and CS-Lab • On completion of the course, students are able to develop programs using C# based on object oriented concepts and write the ROBUST, EXTENSIBLE and EFFICIENT • Programs by using c# code and ASP.Net create dynamic web pages. **Elective -B CS-Lab-303 B) Lab on JAVA Programming – I** • On completion of the course, students are able to develop efficient programs which provides graphical user interface for easy handling of computers using JAVA.	**Elective -A CS-Lab-303 A) Lab on ASP.NET** • On completion of the course, students are able to develop programs using C# based on object oriented concepts and write the ROBUST, EXTENSIBLE and EFFICIENT Programs by using c# code and ASP.Net create dynamic web pages. **Elective -B CS-Lab-303 B) Lab on JAVA Programming – II** • On completion of the course, students are able to develop efficient programs which provides graphical user interface for easy handling of computers using JAVA.

XXX

Department of Physics

F. Y. B. Sc. SEM – I	F. Y. B.Sc. SEM – II
PHY-101: Basic Mechanics 1. Get acquainted detailed basic knowledge of mechanics and classification of physical quantities as scalars and vectors. 2. The knowledge of ordinary differential equations and mechanics enables the student to study the problems in hydrodynamics, blood flow, rocket launching, path of a satellite etc. 3. This course has large scope in various fields like engineering, scientific with the use of basics of mechanics and vector algebra.	**PHY-201 Electricity and Electrostatics** 1. get acquainted detailed basic knowledge of electrostatics and current electricity 2. The knowledge of vector analysis and network theorems are helpful in solving the complicated problems in electricity and hence can be beneficial for commercial applications. 3. Students get aware of electric power and its consumption and calculation of electric bill for domestic as well as industrial purposes 4. Becomes capable of designing the power supplies with maximum efficiency
PHY-102: Dynamics and Elasticity 1. Understand the effect of gravitation on objects and understand the principle of rocket 2. Learn the fundamentals of harmonic oscillator model, including damped and forced oscillators 3. Distinguish between different types of oscillatory motion and to understand the variation of amplitude with time under various circumstances. 4. Distinguish rigid/flexible materials by measuring moduli of elasticity. 5. Differentiate between the streamline and turbulent flow of liquids and reason out the effects of liquids while flowing **6.** Compare the viscosity and interfacial surface tension between the liquids and Assimilate and analyze the motion in fluids point.	**PHY-202: Dielectric, Magnetism and Electromagnetism** 1. Distinguish between different types of magnetic materials and different kinds of magnetism manifested in materials 2. Analyze magnetic properties of a ferromagnetic solid by analyzing or recording its hysteresis behaviour 3. Distinguish between magnetic effect of electric current and electromagnetic induction and to apply the related laws in appropriate circumstances 4. Demonstrate magnetic field of electric current/ electromagnetic induction through proper understanding 5. Compare the principles and working of different types of galvanometer 6. Apply and analyze the behaviour of ac/ dc circuits based on L,C and R **7.** Understand the unification of electric and magnetic fields and Maxwell's equations governing EM waves

F.Y.BSc. SEM – I	F.Y.BSc. SEM – II
PHY-103 Lab • The student is expected to learn from this laboratory course the concept of error and its analysis. • It also allows the student to develop experimental skills to design new experiments in Science and Technology. • With the exposure to these experiments the student can compare the theory and correlate with experiment.	**PHY- 203 Lab** • Able to understand the practically theoretical concept of physics

XXX

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV
PHY 301 Thermodynamics and Kinetic Theory of Gases 1. get detailed knowledge of basic concepts of Thermodynamics and Kinetic Theory of gases. 2. Acquisition of the knowledge from this course aids the students to get the clear idea about the environmental changes 3. Enables the students to apply the basic concepts of Thermodynamics to design various instruments and machines useful in everyday life. 4. Be able to design the engines converting the heat into mechanical work with improved efficiency.	PHY 401 1. To understand the basic concepts of waves and sound. 2. The detailed knowledge of the phenomenon of oscillations like resonance enables the students to design various musical instruments 3. Understanding of Sound effect (Doppler Effect) students get aware about the speed of stars, and also found the applications in Doppler sonography etc. 4. Application of resonance to Series LCR

Department of Physics

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV
PHY 302 Electronics – I 1. student get detailed knowledge of basic concepts of Electronics and related experiments based on theory 2. Able to apply concept of use of knowledge of linear and Digital Electronics in real life. Design circuits problems shooting in circuits and create the scientific temperament.	**PHY 402 Optics and LASERs** 1. Get acquainted about detailed knowledge of basic concepts of Optics and LASERs and related experiments based on theory. 2. Get detailed knowledge concept of interference, Wave front, Intensity distribution and its types Fresnel Biprism Stokes treatments, Interference in thin films. 3. Understanding of Diffraction and Polarization 4. Get acquainted with the principle of LASER and its applications in life
PHY-233 Lab 1. Understand the basic concepts of waves and oscillations like damping oscillations and resonance with the experiments logarithmic decrements, bottle as a resonator , Ketter's Pendulum De Sauty's bridge etc. **2.** Understand the basics of modern physics like electronic charge, energy	**PHY- 243 Lab** 1. Able to understand the practically theoretical concept of physics

S.Y.B.Sc. SEM – III	S.Y.B.Sc. SEM – IV
PHY 304 (Skill Enhancement course) **Renewable energy and Energy Harvesting** 1. Students are able to impar the theoretical knowledge for practical purposes 2. Students get acquainted with the types of energy 3. Acquiring the knowledge of solar energy and apply it for the design of various solar energy sources like PV cell 4. Be aware of other renewable sources like wind, ocean waves 5. Developing the carbon capturing technologies for finding the solution of energy crisis	**PHY 404 (Skill Enhancement course)** **Electrical Circuits and Network Skills** 1. Students get acquainted with the electrical appliances used in daily life. 2. Developing the ability to design the precise power suppliers 3. Familiarization with electrical wiring by hands on training 4. Get aware of electrical measuring instrument

XXX

Department of Chemistry

F.Y.BSc. SEM – I	F.Y.BSc. SEM – II
CH-111: Physical and Inorganic Chemistry • Develop an ability to use conceptual and mathematical tools to express and predict atomic and molecular behavior • Predict atomic structure, chemical bonding or molecular geometry based on accepted models. • Convert scientific equation in straight line to get physical parameter for slope and intercept. • Understand deviation of real gas from ideal behavior. • Understand critical constant and vanderwall's constant.	**CH-121: Physical and Inorganic Chemistry** • Identify methods and instruments that can be used to study chemistry • Evaluate data generated by experimental methods for chemical characterization. • To understand specific and equivalent conductance. • To understand cell constant and use of it to obtain specific and equivalent conductance. • To know Kolhaurash's law and application of it.
CH-112: Organic and Inorganic Chemistry • Understand the general properties of organic compounds, applications of organic compounds. • Understand the Mono functional compounds - Common and IUPAC nomenclature of various type of organic compound. • Understand the the alkane by many organic reaction. • Understand of S- block Elements of alkali metals and Alkaline earth metals • Understand Arrhenius theory, Bronsted- Lowry theory, and Lewis theory. • Understand ionic product of water, Buffer solutions.	**CH-122: Organic and Inorganic Chemistry** • Understand the preparations, reactions and properties of Monohalogen and Dihalogen derivatives of Alkane. • Understand the preparations, reactions and properties of Alcohol, Ether and Epoxide. • Understand the preparations and reactions of carbonyl group. • Understand the preparation of carboxylic acids. • Determine the Molecular weight, formula weight, equivalent weight of organic compounds. • Understand the Electronic structures, size of atoms and ions, ionization energy, metallic and nonmetallic of p block elements.

F.Y.BSc. SEM – I	F.Y.BSc. SEM – II
CH-113: Chemistry Practical • Calibrate the apparatus like volumetric flask, pipette and burette. • Understand the determination of heat of solution, equivalent weight, surface tension etc. • Carry out qualitative analysis of acidic and basic radicals. • Learn the applications of types of titrations for various estimations • Carry out quantitative analysis by gravimetric method • Carry out quantitative analysis by volumetric method	**CH-123: Chemistry Practical** • Handle viscometer to determine the viscosity and relative viscosity of liquids . • Carry out quantitative analysis by instrumental method using Conductometer. • Estimate of aniline / phenol. • Perform qualitative analysis of organic compounds. • Carry out quantitative analysis by volumetric method and gravimetric methods

XXX

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV
SY B.Sc CH 231: Physical and inorganic chemistry • Understand the Electronic structures, size of atoms and ions, ionization energy, metallic and nonmetallic of d block elements. • Understand concept of Helmolthz free energy • Understand numerical calculations of Gibbs free energy. • Understand concept of vapor pressure of liquids. • Understand the concept of physical properties of metals • Learn methods of purification of ores.	**CH 241 Physical and inorganic chemistry** • Understand colligative properties and its application calculation of molecular weight of solutes • Understand concept of electromotive force and its measurement • Understand about properties of Lanthanides and actinides. • Understand concept of s-s, s-p, p-p, p-d & d-d combination of orbitals. • Understand about classification of electrodes.
CH 232: Organic and analytical chemistry: • Review the concept of isomers and discuss the isomer which results	**CH 242: Organic and analytical chemistry** • Understand the synthesis and reaction of 5, 6 member and condensed

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV
from free rotation of C-C single bond, from a chirallity, from restricted rotation, R, S and E, Z nomenclature. • Study of amines their formation reactivity. • Study of reactivity, preparation and reactions of organo Li, Cu, Zn compounds. • Understand the importance of analytical chemistry in analysis of compounds by titrimetric, gravimetric and instrumental methods. • Know the importance of sampling methods and ways of interpretation of results of analysis. • Determine the causes of errors and their minimization during analysis • Learn the application of types of titrations for quantitative analysis of the samples.	heterocyclic systems. • Understand the synthesis of synthetic reagents and their synthetic utility. • Know the mechanism and stereochemistry of E1, E2 reaction. • Understand the concept of quantitative analysis by gravimetric methos. • Understand the concept for separation of analytes in samples by thin layer, paper and column chromatographic methods.
CH 233: Chemistry practical: • Understand techniques chromatography for separation of components in the mixture. • Understand recrystallization for purification of organic compounds. • Prepare various inorganic complexes. • Analyze compounds by titrimetric, gravimetric and instrumental methods.. • Understand to determine thermodynamic parameter.	**CH 243: chemistry practical:** • Carry out qualitative analysis of organic compounds. • Determine molecular weight by depression of freezing point method. • Handle landsbergers apparatus for determination of molecular weight. • Estimate of Nickel and Barium gravimetrically. • Make use of potentiometer for determination of standard electrode potential.

XXX

Department of Chemistry

T.Y.BSc. SEM – V	T.Y.BSc. SEM – VI
CH 351: Physical chemistry • Understand spontaneous and non spontaneous processes. • Understand the importance of salt bridge in electrochemical cell. • Understand the concept electrochemical cell and determination of potential of cell • Understand the laws of photochemistry (Grothus Draper Law and Stark Einstein law) • Understand the concept quantum yield and fluoresce and phosphorescence from Jalblonski diagram. • Understand the various devices to measure the radiation from radioactive sample.	**CH-361: Physical chemistry.** • Understand the types of spectra, Rotational, Vibration and Electronic energy levels. • difference between order and Molecularity • Understand the first, second and third order reaction. • Understand the concept anisotropic, isotropic, etch figure, polymorphism, • Learn concept Photoelectric effect, Compton Effect and Heisenberg's uncertainty principals. • Understand the concept of X- ray analysis.
CH-352: Inorganic chemistry • Understand the basic concept of the co-ordination compound, and identify the types of given ligand, chelates. • Understand the different physical method for the study of complexes and assumptions, drawbacks and isomerism in Werner's theory. • Understand Effective atomic number (EAN) and how to calculate EAN for any given complexes. • Understand the modern theories of metal-ligand bond related to valence bond theory. • Application of CFT related to different geometry e. Square planer,	**CH-362: Inorganic chemistry** • Understand the electronic structure, Extraction uses, oxidation states biological role of Cu. • Know about the all basic theory of Acid and bases. • Understand the concept of Hard and Soft acid bases concept theories, application and limitations. • Know the different types and theories of Corrosion and how to protect Metal from corrosion.

T.Y.BSc. SEM – V	T.Y.BSc. SEM – VI
tetrahedral, Octahedral. • Understand the basic concept about CFT e. Spin magnetic moment, crystal field stabilization energy related to weak and strong field, limitation of theory. • Understand the modern theories of metal-ligand bond related to Molecular orbital theory, and difference between B.T., C.F.T. and M.O.T.	
CH-353: Organic chemistry • Understand Polarity picture of carbonyl group and nucleophilic addition reaction to it. • Introduction concept of aromaticity electrophilic and nucleophilic aromatic substitution reaction. • Molecular rearrangement involving migration to C, N and Oxygen. • Drawing the resonating structures. • Understand Nuclophic substitution reactions. • Understanding electrophilic addition reactions.	**CH-363: Organic chemistry** • Understands common terms in spectroscopy. • Learn Physical methods of structure determination which includes IR, UV and NMR. • Solve the problems based on IR, UV and NMR. • Understand retro synthesis. • Predict synthons and reagents. • Solve the problems based on retro synthesis.
CH-354: Analytical Chemistry • Understand procedure of extraction of metal ions using Solvent Extraction process. • Understand the application of Ion Exchange Chromatography method for the separation of cations and anions using different types of resins.	**CH-364 Analytical Chemistry** • Perform the analysis of samples using instrumental methods • Understand the concepts of spectrometry, know the principles of instruments and their applications • Understand principle, working and applications of Flame and Plasma

T.Y.BSc. SEM – V	T.Y.BSc. SEM – VI
• Understand applications of Size Exclusion Chromatography for the separation of analytes based on their size and shapes. • Understand the working of Gas Chromatographic unit and apply the knowledge to separate volatile compounds in sample. • Understand Principle, choice of column materials for HPLC and its application. • Understand Principles of Electrophoresis and choice of techniques of electrophoresis for various applications	Emission Spectrometry. • Understand principle, Instrumentation and application of Atomic Absorption Spectrophotometry • Understand principle, Instrumentation and applications of Turbidimetry and Nephelometry. • Understand principle, Instrumentation and applications of thermogravimetric methods like TGA, DTA and DSC.
CH-355: Industrial chemistry • Understand general concept of Industrial chemistry. • Understand manufacturing of sugarcane. • Understand general idea of differ physical methods used in manufacturing. • Understands various types of fertilizer. • Understand manufacturing of Beer and spirit. • Understand the aspects of small scale industry.	**CH-365: Industrial chemistry** • Understand the process of manufacturing of petrol and gasoline. • Understand the process of manufacturing of methanol. • Understand the process of manufacturing of soap. • Understand the process of manufacturing of detergents. • Understand classification of dyes and paints. • Understand properties of drugs.
CH 356: B Environmental chemistry • Understand the concept to awareness about environmental chemistry • Understand the concept about atmosphere and different layer and composition • Understand the concept. awareness about air pollution and organic	**CH 366: Polymer chemistry** • Understand the basic concepts of polymerization. • Understand the different methods of polymerization. • Understand various techniques of polymerization. • Understand the preparation, properties and applications of PE, PVC,

T.Y.BSc. SEM – V	T.Y.BSc. SEM – VI
inorganic pollutants • Understand the concept, water pollution and domestic sewage waste water, industrial pollution agriculture pesticide water pollution. • Understand the different methods of water treatment, water effluents and sewage water. • Understand the green house gases and global warming.	Polystyrene, polyacrilonytrile, • Understand the concept Glass transition temperature
CH-357: Physical Chemistry Practical • Prepare molar and normal solutions of various concentrations. • Determine concentration of unknown solutions by Spectrophotometric method. • Measure the pH, pKa and Ka of various acids by potentiometry. • Measure refractive index, molar refraction and unknown concentration of various solvents. • Determine the molecular weight of a given polymer by turbidimetry. • Investigate the reaction rate.	**CH-367: Physical Chemistry Practical** • Prepare molar and normal solutions of various concentrations. • Determine concentration of unknown solutions by Spectrophotometric method. • Measure the pH, pKa and Ka of various acids by potentiometry. • Measure refractive index, molar refraction and unknown concentration of various solvents. • Determine the molecular weight of a given polymer by turbidimetry. • Investigate the reaction rate.
CH 358: Inorganic practical • Estimate ores and alloy by gravimetric and volumetric method. • Separate and analyze binary mixtures by qualitative method • Prepare and determine percent purity of various inorganic complexes. • Perform chromatographic technique (paper chromatography).	**CH 368: Inorganic practical** • Estimate ores and alloy by gravimetric and volumetric method. • Separate and analyze binary mixtures by qualitative method • Prepare and determine percent purity of various inorganic complexes. • Perform chromatographic technique (paper chromatography).

T.Y.BSc. SEM – V	T.Y.BSc. SEM – VI
• Estimate Lead, Iron by gravimetric method. • Estimate Titanium and Iron by Spectrophotometric method.	• Estimate Lead, Iron by gravimetric method. • Estimate Titanium and Iron by Spectrophotometric method.
CH 359: Organic practical: • Separate and analyze binary water insoluble mixture • Separate and analyze binary water soluble mixture • Estimate - acetamide, glucose by volumetric method • Estimate basicity of various acids. • Prepare various organic compounds. • Understand Thin Layer Chromatographic techniques and physical constant.	**CH 369: Organic practical:** • Separate and analyze binary water insoluble mixture • Separate and analyze binary water soluble mixture • Estimate - acetamide, glucose by volumetric method • Estimate basicity of various acids. • Prepare various organic compounds. • Understand Thin Layer Chromatographic techniques and physical constant.

XXX

Department of Mathematics

F.Y.BSc. SEM – I	F.Y.BSc. SEM – II
MTH-101: Matrix Algebra: 1. Understanding of operations on matrices 2. Understanding the concept of inverse of a matrix 3. Matrices are used in solving linear equations. 4. Linear equations are vital for solving any differential equations 5. Many areas of Numerical analysis depend upon linear equations. 6. Specific fields of applications are computer graphics, Cryptography etc.	**MTH-201: Ordinary Differential Equations:** 1. To understand the necessity of differential equations 2. To learn about forming differential equations from physical situations 3. To know various types of differential equations 4. To practice methods of solution for various types of differential equations. 5. It is useful for methods of momentum and energy transfer. 6. It is used in all branches of engineering.
MTH-102: Calculus 1. It is used in almost all branches of engineering. 2. It is a science that deals with rate of change. 3. Understanding the concept of differentiation. 4. Understanding the concept of Integration. 5. Applications of differentiation include measuring velocity, acceleration, etc. 6. Applications of differentiation include maxima, minima ,increasing and decreasing functions	**MTH-202: Theory of equations:** 1. To know about number system 2. To learn division algorithm and its application 3. To learn g. c. d and l. c .m. and its relation 4. To study properties of divisibility 5. To know about congruence classes 6. To understand the famous Fermat's theorem. 7. To learn how to solve various types of equations.

MTH-103(A): Coordinate Geometry:

1. Understanding the concept of distance between two points
2. Understanding the concept of slope
3. Understanding the change of origin and change of scale.
4. Learn various forms of straight lines.
5. Learn about various conic sections.
6. It is used in Mechanics and Astronomy.

MTH-203(A): Laplace Transforms:

1. To know Method of changing equations from one form to another easier form
2. It is used to solve both ordinary and partial differential equations.
3. Applications are in all branches of engineering.
4. To learn properties of Laplace transforms.
5. To learn properties of inverse Laplace transforms.
6. To learn convolution theorem and Aplications
7. To learn properties of inverse Laplace transforms.

F.Y.BSc. SEM – I	F.Y.BSc. SEM – II
MTH-103(B): Graph Theory: 1. Understand the basics of graph theory. 2. To learn operations on graphs. 3. To learn about connected and disconnected graphs. 4. To understand various problems related with planar graphs 5. To learn Hamiltonian and Eulerian paths and its Applications 6. To learn weighted graph and traveling salesman problem 7. To understand trees, spanning trees and minimum spanning trees	**MTH-203(B): Numerical Analysis:** 1. It is used for solving a system of equations 2. It has application in all branches of engineering. 3. To know how to find the roots of transcendental equations. 4. To learn how to interpolate the given set of values 5. To understand the curve fitting for various polynomials 6. To learn numerical solution of differential equations.

Department of Mathematics

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV
MTH 301: Calculus of Several variables: 1. It is used in almost all branches of engineering. 2. It deals with calculus of several variables. 3. To learn homogeneous function, chain rule and Euler's theorem for homogeneous function. 4. To understand the importance of Taylors series for two variables. 5. To learn application of partial differentiation to find extreme value and langrage's method. 6. To understand Mean value theorem. 7. To find area by double integration. 8. To find volume by triple integration.	**MTH 401: Complex Variables:** 1. It is widely used in Fluid Mechanics and Electrical engineering. 2. To learn properties of complex numbers. 3. To understand the use of complex numbers in the field of Calculus. 4. To learn De Moivre's theorem and its applications 5. To learn the importance of analytic functions and C. R. equations. 6. To understand harmonic functions, Laplace differential equation and construction of analytic function. 7. To learn Cauchy's theorem and Cauchy's integral formulae for solving integral. 8. To gain knowledge of singularities and residues. 9. To apply the knowledge of residues in complex integration. 10. To learn the importance of residue theorem for solving integrals

Department of Mathematics

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV
MTH-302(A): Algebra: 1. Algebra is science of operations 2. It is widely used in Computer science and T. 3. It is also useful for logic and fuzzy set theory 4. To understand the concept of groups. 5. To understand the concept of subgroups. 6. To learn langrage's theorem and its corollaries. 7. To learn Fermat's theorem and Euler's theorem. 8. To learn homomorphism and isomorphism. 9. To understand concept of automorphism of groups . 10. To under the structure of ring, integral domain, field and Boolean ring . 11. To understand basic properties of rings and their types such as integral domain and field. **MTH-302(B): Theory of Groups:** 1. To learn computations using algebra. 2. It is mainly used in Computer science and T. 3. It is also useful for logic and fuzzy set theory 4. To understand the concept of groups. 5. To learn homomorphism and isomorphism. 6. To learn group codes and how to encode and decode.	**MTH 402(A): Differential Equations:** 1. It is used in all branches of engineering. 2. It is useful for methods of momentum and energy transfer. 3. To study existence and uniqueness about solutions. 4. To learn about the simultaneous differential equations. 5. To learn about the method of solving simultaneous differential equations 6. To learn about the method of variation of parameter for solving differential equations. 7. To understand the methods of solution for total differential equations. 8. To learn difference equation, Forward and backward difference and its applications. **MTH 402(B): Differential and Difference Equations:** 1. It is useful for methods of momentum and energy transfer. 2. To study existence and uniqueness about solutions. 3. To learn about the simultaneous differential equations. 4. To understand the methods of solution for total differential equations 5. It is widely used in Civil engineering, Mechanical engineering, etc. 6. To understand definition and properties of difference equations.

Department of Mathematics

MTH 304 : SEC-I Set Theory and Logic	MTH 404 :SEC-II Vector Calculus
1. To learn concept of set theory. 2. To learn some standard set such as natural , integer, rational and real numbers. 3. To learn about universal set, empty set, subset. 4. Uses of the language of set theory, designining issues in different subjects of mathematics 5. understand the issues associated with different types of finite and infinite sets via countable uncountable sets 6. To learn about operations on sets and its applications. 7. To learn logical mathematical reasoning, formulate theorems and definitions **8.** To learn statements and truth values; concept of tautology, contradiction and quantifiers.	1. To understand scalar and vector . 2. To learn concept of collinear , coplanar vectors. 3. To understand scalar and vector products. 4. To understand vector valued functions and their limits and continuity and use them to estimate velocity and acceleration of partials. 5. To understand concept of gradient , divergence and Curl. 6. To Calculate the curl and divergence of a vector field. 7. To learn line integral, conservative vector field 8. Set up and evaluate line integrals of functions along curves. 9. To learn surface integral and greens theorem.

XXX

Department of Botany

F.Y.BSc. SEM – I	F.Y.BSc. SEM – II
Bot. 101: Microbial Diversity, Algae & Fungi • To study the diversity among Microbes. • To study systematic, morphology and structure of Bacteria, Viruses, Algae and Fungi. • To study the life cycle pattern of Bacteria, Viruses, Algae and Fungi. • To study the useful and harmful activities of Bacteria, Viruses, Algae and Fungi	**Bot. 201: Diversity of Archegoniates** • To study salient features of Archegoniates. • To make students aware of the status of higher cryptogams& gymnosperms as a group in plant kingdom. • To study the life cycles of selected genera. • To study economic and ecological importance of Archegoniates.
Bot. 102: Plant Taxonomy • To study the diversity of angiosperms. • To study the comparative account among the families of angiosperms. • To study the economic importance of the angiospermic plants. To study the distinguishing features of angiosperm families.	**Bot. 202: Plant Ecology** • To know scope and importance of the discipline. • To study plant communities and ecological adaptations in plants. • To know about conservation of biodiversity. • To study the botanical regions of India and vegetationtypes of Maharashtra.
Bot. 103: Practical	**Bot. 203: Practical**

XXX

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV
BOT.-231: Bryophytes and Pteridophytes • Understand the morphological diversity of Bryophytes and Pteridophytes. • Understand the economic importance of the Bryophytes and Pteridophytes.	**BOT.-241: Plant Physiology** • Know importance and scope of plant physiology. • Understand the plants and plant cells in relation to water. • Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways.

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV
• Know the evolution of Bryophytes and Pteridophytes.	• Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration. • Learn about the movement of sap and absorption of water in plant body. • Understand the plant movements.
BOT.-232: Morphology of Angiosperms [60 Lectures] • Understand the habit of the angiosperm plant body. • Know the vegetative characteristics of the plant. • Learn about the reproductive characteristics of the plant. • Understand the plant morphology.	**BOT.-242 Taxonomy of Angiosperms** • Understand the diversity of angiosperms. • Understand the comparative account among the families of angiosperms. • Know the economic importance of the angiosperm plants. • Understand the distinguishing features of angiosperm families.
BOT.-233 Lab	**BOT.- 243 Lab**

XXX

Department of Zoology

F.Y.BSc. SEM – I	F.Y.BSc. SEM – II
ZOO 101 : ANIMAL DIVERSITY I **1.** To classify phylum Porifera with taxonomic keys. 2. To describe the phylum Cnidaria and it's polymorphism 3. To describe platyhelminthes and life history of parasites 4. To describe general characters of Nemathelminthes and their parasitic adaptation. 5. To describe general characters and classification of Annelida and metamerism in Annelids 6. To describe general characters and classification of Arthropods; Vision in arthropods, metamorphosis in insects. 7. To identify the given of Mollusc and Torsion in gastropods. 8. General characters and classification up to classes;water vascular system in Astroidea.	**ZOO 201 Comparative Anatomy of Vertebrates** 1. To understand Integumentary system and different derivatives of integument w.r.t. glands and digital tips. 2. To study and understand skeletal system and evolution of visceral arches. 3. To know general plan of digestive system and brief account of alimentary canal and digestive glands. 4. To understand respiratory system brief account of gills, lungs, air sacs and swim bladder. 5. Comparative study of circulatory system and evolution of heart and aortic arches. 6. To understand urinogenital system and succession of kidney. Evolution of urinogenital ducts. 7. To understand comparative account of brain, nervous system and sense organ.
ZOO 102 Animal Diversity II 1. To identify general features and phylogeny of protochordata. 2. To identify general features of Agatha and classification of cyclostomes up to classes. 3. To describe general features and classification up to orders; Osmoregulation in Fishes. 4. To describe general features and classification up to orders; Metamorphosis in frog , parental care. 5. To identify general features and classification up to orders; Extinct reptiles,	**ZOO 202 Developmental Biology of Vertebrates** 1. Understand basic concepts of development biology 2. Understand how fertilization and cleavage occure 3. Understand the process and consequences of gastrulation. 4. Understand mesoderm induction and neural induction. 5. Understand basic concepts of organogenesis 6. Understand basic concepts of growth, regeneration and aging 7. Understand basic concepts of gene expression and regulations.

poisonous and nonpoisonous snakes , Biting mechanism in snakes 6. To classify general features and classification up to orders; Flight adaptations in birds. 7. To identify classification up to orders; Origin ofmammals. •	
ZOO 103 Animal Diversity I & II 1. To study and understand the classification of whole phyla includes in Nonchordates with the help of charts/ models/ pictures. 2. To understand T.S. and L.S. of synonyms 3. To understand life history stages of Taenia and T.S. of male and female Ascaris. 4. Understand the classification various classes of phylum chordate i.e. pisces, Reptiles, Aves and mammals. 5. To identify poisonous and no poisonous snakes.	**ZOO 203 Comparative Anatomy & Developmental Biology of Vertebrates** 1. To understand structure of bones disarticulated skeleton of fowl and rabbit. 2. To study carapace and plastron of turtle/ tortoise. 3. To understand herbivorous and one carnivorous mammalian skulls. 4. To identify developmental stages of cleavage, blastula, gastrula, neurula, tail bud stage, tadpole external and internal gill stages. 5. To understand histological structure of different types of placenta. 6. To understand examination of gametes- Sperm and Ova. •

XXX

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV

Zoo-301 . Physiology	Zoo 401.. Genetics
1. Have an enhanced knowledge and appreciation of mammalian physiology; 2. Understand the functions of important physiological systems including nerve and muscle, Digestion, Respiration, Excretion, Cardiovascular system, Reproduction and Endocrine Glands. 3. Understand how these separate system interact to yield integrated physiological responses to challenges such as exercise, fasting and ascent to high altitude, and how they can sometimes fail. 4. Be able to perform, analyse and report on experiments and observations in physiology; 5. Be able to recognize and identify principal tissue s tructures	1. Upon successful completion, students will have the knowledge and skills to explain the key concepts in population, evolutionary and quantitative genetics including the basis of genetic variation, heritability, linkage, crossing over, chromosomal mapping,mutation and sex determination.

Department of Zoology

S.Y.BSc. SEM – III	S.Y.BSc. SEM – IV
Zoo 302.. Biochemistry 1. Understand the chemistry of Carbohydrates, lipids, proteins and enzymes. 2. Describe the classification and structural organization of carbohydrates, proteins and lipids. 3. Describe the classification and mechanism of enzyme action and understand the basics of enzymes. 4. Describe the significance of secondary metabolites	**Zoo 402.. Evolutionary Biology** 1. Natural selection as key to understand the natural world 2. How natural selection produces adaptation. 3. The origins of genetic variation. 4. Fitness , the common currency for studying adaptive genetic change.
Zoo 303.. Practicals on Physiology and Biochemistry 1. At the end of course students should have an enhanced knowledge and appreciation of mammalian physiology. 2. Be able to perform preparation of hemin crystal and haemochromogen crystal 3. Be able to recognize and identify principle tissue structure. 4. Understanding Good laboratory practices in a biochemistry laboratory. 5. To understand the properties of carbohydrates, protein..	**Zoo 403.. Practicals on Genetics and Evolutionary Biology** 1. Understand the range of population genetic analysis including sex typing, inheritance, gene interaction, linkage, recombination, gene mapping and karyotyping 2. Students will be able to describe the history and development of evolutionary thought about fossils, phylogeny of horse (limbs and teeth), Darvin finches...

Department of Zoology

SE Course ..Sec I.. Apiculture	SEC II ..Medical Diagnostics
1. Students will be able to understand bee biology and behavior 2. Types of bees, life cycle 3. Handle beekeeping systems, equipments 4. Hives installation, Tools, Behive management, Colony management 5. Manage insects, diseases and nuisances in bee hive. 6. Harvest, process and market the produce.	1. To develop an understanding of the scientific basis underpinning medical diagnostic assays and technologies and the associated biotechnological principles leading to clinical use and commercial implementation 2. Diagnostic methods used for blood, urine analysis 3. Non infectious , infectious diseases, Tumours...

XXX

Language Faculty of Science and Technology

F. Y. B. Sc. Sem. I	F. Y. B. Sc. Sem. II
Sem I – AEC (1 A) Marathi : Ability Enhancement 1. To introduce various stories written by Madgulkar. 2. To improve the skill of dialogue writing. 3. To improve the skill of presentation.	**Sem II – AEC (2 A) Marathi : Ability Enhancement** 1. To introduce various stories written by Madgulkar. 2. To improve the various writing skill. 3. To improve the letter writing skill.

S. Y. B. Sc. Sem. III	S. Y. B. Sc. Sem. VI
Marathi (AECC 1) : Science Fiction and Ability Enhancement 1. To introduce science fictions of marathi literature. 2. To improve writing skill.	**Marathi (AECC 2) : Comedy Stories and Writing of Advertisement** 1. To introduce comedy stories of marathi literature. 2. To improve the writing skill of advertisement

English

- To introduce the students with writing and reading skill
- To acquaint the students with the use of English language through different means
- To acquaint the students with the creative use of English language