2018-19

K.R.T.Arts, B.H. Commerce and A.M. Science
(K.T.H.M.) College, Nashik
Internal Quality Assurance Cell

Program Outcome
Program Specific Outcome
Course Outcome

Maratha Vidya Prasarak Samaj's
K.R.T. Arts, B.H. Commerce and A.M. Science (KTHM) College Nashik

Program Outcomes, Program Specific Outcomes, Course specific Outcomes

Department of Chemistry

	Program outcome : B.Sc. (Chemistry)
1.	Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.
2.	Solve the problem and also think methodically, independently and draw a logical conclusion.
3.	Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.
4.	Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.
5.	Find out the green route for chemical reaction for sustainable development.
6.	To inculcate the scientific temperament in the students and outside the scientific community.
7.	Use modern techniques, decent equipments and Chemistry software"s

	Program Specific outcome : B.Sc. (Chemistry)
1.	Gain the knowledge of Chemistry through theory and practical's.
2.	To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.
3.	Identify chemical formulae and solve numerical problems.
4.	Use modern chemical tools, Models, Chem-draw, Charts and Equipments
5.	Know structure-activity relationship.
6.	Understand good laboratory practices and safety.
7.	Develop research oriented skills.
8.	make aware and handle the sophisticated instruments/equipments.

	Program outcome : M.Sc. (Analytical Chemistry)
1.	Demonstrate, solve and an understanding of major concepts in all disciplines of Chemistry.
2.	Solve the problem and also think methodically, independently and

	draw a logical conclusion.
3.	Create an awareness of the impact of chemistry on the society, and development outside the scientific community.
4.	Become professionally trained in the area of Industry, material science, lasers and Nano-Technology
5.	Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Chemistry experiments
6.	To inculcate the scientific temperament in the students and outside the scientific community.
7.	Apply modern methods of analysis to chemical systems in a laboratory setting.

Program Specific outcome : M.Sc. (Analytical Chemistry)	
1.	Learn about the potential uses of analytical industrial chemistry.
2.	Carry out experiments in the area of organic analysis, estimation, separation, derivation process, conduct metric and potentiometric analysis.
3.	Learn the classical status of thermodynamics.
4.	Gathers attention about the physical aspects of atomic structure, various energy transformation, molecular assembly in nanolevel andsignificance of electrochemistry.
5.	Understand good laboratory practices and safety.
6.	Introduce advanced techniques and ideas required in developing area of Chemistry.
7.	Make aware and handle the sophisticated instruments/equipments.
8.	Enhance students‟ ability to develop mathematical models for physical systems

Program outcome : M.Sc. (Organic Chemistry)	
1.	Determine molecular structure by using UV, IR and NMR.
2.	Study of medicinal chemistry for lead compound.
3.	Improve the Skill of student in organic research area.
4.	Synthesis of Natural products and drugs by using proper mechanisms.
5.	Study of Asymmetric synthesis.
6.	Determine the aromaticity of different compounds.
7.	Solve the reaction mechanisms and assign the final product.

Program Specific outcome : M.Sc. (Organic Chemistry)	
1.	Know the structure and bonding in molecules/ ions and predict the Structure of molecule/ions.
2.	Understand the various type of aliphatic, aromatic, nucleophilic substitution reaction.
3.	Understand and apply principles of Organic Chemistry for

	understanding the scientific phenomenon in Reaction mechanisms.
4.	Learn the Familiar name reactions and their reaction mechanisms.
5.	Understand good laboratory practices and safety.
6.	Study of organometallic reactions.
7.	Study of free radical,bycyclic compound, conjugate addition of Enolates and pericyclic reactions.
8.	Study of biological mechanisms using amino acids

Program outcome : M.Sc.I (Inorganic Chemistry)	
1.	Learnt about geometry and shape of the molecule and find out the point group of inorganic molecules, molecular orbital and its orientation .
2.	Studied the main group elements , their properties and applications.
3.	Studied the coordination chemistry and microstate table ,splitting of different terms electronic spectra , Magnetic properties etc.
4.	Studied various biologically active molecules such as haemoglobin, myoglobin hemerythrin and vitamins . Metalloprotein and metalloenzymes.
5.	Analysis of various ores, alloys and nanomaterials applications.
6.	Synthesis of coordination complexes, Conductometry analysis and characterised various metal complxes.
7.	Kinetics Experiments, Ion – Exchange Chromatography, Solvent Extraction and Colorimetry have been studied.

Program Specific outcome : M.Sc.II (Inorganic Chemistry)	
1.	Studied the gravimetric and volumetric analysis of ores and alloys.
2.	In addition Prepared various inorganic complexes and determine its % purity & its characterization using spectrochemical techniques.
3.	Preparation of nanomaterials
4.	Also understood various chromatographic techniquessuch as HPLC,GCMS, etc.
5.	Studied the heterogeneous catalysis, introduction, synthesis and its applications.
6.	studied the nonmaterial synthesis application &characteristics.
7.	Preparation and properties of transition metal carbonyls & to understand the 18 electron rule and its applications
8.	Studied various physical methods such as TGA,DTA-DSC,NMR,IR,UV-Visible, XRD in inorganic chemistry .

Course Outcomes of BSc (Chemistry):

Class	Course title	Outcome
FYBSc (Paper-I)	CH-101 Physical chemistry	• Learn the thermodynamic principles, calculation of different types of energies Exergonic and Endergonic reaction, Gas equilibrium • Concept of PH of different salts,buffer solution, common ion effect

FYBSc-(Paper-II)	CH-101 Organic chemistry	• To learn fundamentals principles and developments of organic chemistry • Learn the confirmation .cis –trans • Learn difference in alkane ,alkene and alkyne
FYBSc-(Paper-III)	CH-103 Chemistry Practical	• Chemical safety and Lab safety • Determination of thermochemical parameters • Techniques of pH measurements , Preparation of buffer solutions • Elemental analysis of organic compounds, Chromatographic Techniques for separation of constituents of mixtures

Semester II

Class	Course title	Outcome
FYBSc (Paper-I)	CH-201 Inorganic chemistry	• Various theories and principles of atomic structure • Origin of quantum mechanics , Schrodinger equation , Significance of quantum numbers, Shapes of orbitals • To learn periodic table ,properties trends • learn chemical bonding of different molecule
FYBSc-(Paper-II)	CH-202 Analytical chemistry	• Introduction to Analytical Chemistry • Relation between molecular formula and empirical formula • Purification techniques for organic compounds. • Theoretical background for Paper and Thin Layer Chromatography • Applications of pH meter
FYBSc-(Paper-III)	CH-203 Chemistry Practical	• Inorganic Estimations using volumetric analysis • Synthesis of Inorganic compounds • Analysis of commercial products • Purification of organic compounds. Preparations and mechanism of reactions involved

S.Y.B.Sc. Semester I

SYBSc-(Paper-I)	CH-211 Physical & Analytical Chemistry	• Introduction to Analytical Chemistry, Chemical analysis and its applications, Sampling, Common techniques, Instrumental methods and other techniques, Choice of method. Basic principles in qualitative analysis , Meaning of common ion effect, Role of common ion effect and solubility product
SYBSc (Paper-II)	CH-212 Organic & Inorganic Chemistry	• In Organic Chemistry, Students learnt about the Stereochemistry, where they have dealt with chirality, optical activity and polarimetry, enantiomers, absolute configuration, R/S system nomenclature. In addition, they

		learnt about Baeyer strain theory and cyclohexane's conformations and geometrical isomerism. Also organic reaction and mechanism. Substitution and elimination reactions also have been studied. • Definition of corrosion. ii) Types of corrosion. iii) Mechanism of corrosion. iv) Factors affecting corrosion. v) Methods of prevention of metal from corrosion. vi) Meaning of passivity. vii) Different theories of passivity. viii) Galvanising, Tinning

S.Y.B.Sc. Semester II

SYBSc (Paper III)	CH-221 Physical & Analytical Chemistry	• Meaning of equivalent weight, molecular weight, normality, molality, primary and secondary standards. Different way to express concentrations of the solution, Preparation of standard solution, Calibrate various apparatus such as burette, pipette, volumetric flask, barrel pipette etc. Types instrument
SYBSc (Paper-IV)	CH-222 Organic & Inorganic Chemistry	• Learnt about oxidation and reduction concept. Catalytic hydrogenation were studied, where Birch reduction, Resenmund's reduction were studied.
SYBSc (Paper-V)	Practical Course in Chemistry CH – 223	• Verify theoretical principles experimentally • Interpret the experimental data • Improve analytical skills • Correlate the theory and experiments and understand their importance

T.Y.B.Sc. Semester I

TYBSc (Paper-I)	CH-331 Physical Chemistry	• Write an expression for rate constant K for third order reaction • Solve the numerical problems based on Rate constant • Understand the term specific volume, molar volume and molar refraction • Know the meaning of phase, component and degree of freedom • Derive the expression for rotational spectra for the transition from J to J+1
TYBSc (Paper-II)	CH-332 Inorganic Chemistry	• Know the meaning of various terms involved in co-ordination chemistry • To understand Werner"s formulation of complexes and identify the types of valences • Know the limitations of VBT • Know the shapes of d-orbital"s and degeneracy of d-orbital"s

		• Draw the geometrical and optical isomerism of complexes
TYBSc (Paper-III)	CH-333 Organic Chemistry	• Define organic acids and bases. • Distinguish between geometrical and optical isomerism. • Discuss kinetics, mechanism and stereochemistry of SN1 and SN2 reactions. • Compare between E1 and E2 reactions. • Understand the evidences, reactivity and mechanism of various elimination and substitution reactions.
TYBSc (Paper-IV)	CH-334Analytical Chemistry	• Know the principles of common ion effect and solubility product. • Study the methods of thermo-gravimetric analysis. • Understand the principles of Spectro-photometric analysis and properties of electromagnetic radiations. • Study the Voltammetry and Polarography as an analytical tool. • Measure the absorbance of atoms by AAS.
TYBSc (Paper-V)	CH-335 Industrial Chemistry	• Know the importance of chemical industry. • Classify various insecticides. • Study the nutritive aspects of food constituents. • Understand the characteristics of some food starches. • Study the manufacture of cement, dyes, Glass, Soap and Detergents by modern methods.
TYBSc (Paper-VI)	CH-336-EEnvironmental Chemistry	• Know the role of environmental chemistry and its potential • Understand the basic concept of properties of soil & its classification on the basis of pH. • Know the different plant nutrients, their functions and deficiency symptoms. • Identify the problematic soil pollution, air, water pollution. • Have the knowledge of various pesticides, insecticides, fungicides and herbicides and their impact

T.Y.B.Sc. Semester II

TYBSc (Paper-I)	CH-331 Physical Chemistry	• Understand Mechanics of system of particles. • Know the Redox reaction. • Study the Nuclear Chemistry. • Solve the cell reaction and calculate EMF.. • Calculate interplanar distance. • Understand De-Broglie hypothesis and Uncertainty principle

		• Derive Schrodinger's time dependent and independent equations
TYBSc (Paper-II)	CH-332 Inorganic Chemistry	• Study the electronic configuration of lanthanides and actinides. • Get knowledge of Crystalline solid. • Understand different operation in stoichiometric molecule. • Study the Bio-inorganic chemistry. • Understand the p-type semiconductor and n-type semiconductor
TYBSc (Paper-III)	CH-333 Organic Chemistry	• To study UV, IR and NMR spectroscopy. • Discuss different types of rearrangement reactions. • Determine structure of compound by spectroscopic methods. • Understand the difference between carbocation and carbanion. To study alkaloids, Ephedrine, citral molecule with their properties and application.
TYBSc (Paper-IV)	CH-334Analytical Chemistry	• Know the different analytical techniques. • To understand different types of separation techniques. • To study principle, construction and working of GC and HPLC. • To give an extended knowledge about chromatographic techniques used for separation of amino acids. • Discuss the problem based on distribution coefficient and extraction techniques.
TYBSc (Paper-V)	CH-335 Industrial Chemistry	• Know the various pharmaceutical drugs, their application and synthesis. • To study the waste management. • To understand the function of dyes, paints and pigments. • To study the various type of surfactants. • To know about molasses and bagasse. • To study the different types of polymer.
TYBSc (Paper-VI)	CH-336-EEnvironmental Chemistry	• Know the various environmental issuesand their solution. • To study the waste management. • To understand the function of chemicals and application of green chemistry. • To study the various type of surfactants. • To know natural sources of energy. • To study the different types of hazardous and toxic chemicals.
TYBSc (Paper-	CH-347 Physical	• Calculate molar and normal solution of various concentrations.

VII)	chemistry practical's	• Determine specific rotations and percentage of optically active substances by polarimetrically. • Study the energy of activation and second order reaction. • Study the stability of complex ion and stranded free energy change and equilibrium constant by potentiometry. • Find out the acidity, Basicity and PKa Value on pH meter.
TYBSc (Paper-VIII)	CH-348Inorganic chemistry practical's	• Study the gravimetric and volumetric analysis of ores and alloy. • Prepare a various inorganic complex and determine its % purity. • To study binary mixture with removal of borate and phosphate. • To understand the chromatographic techniques
TYBSc (Paper-IX)	CH-349 Organic chemistry practical's	• Perform the Binary mixtures. • Preparation of organic compounds, their purifications and run TLC. • Determination of physical constant: Melting point, Boiling point. • Different separation techniques.

Course Outcomes of M.Sc (Analytical, Organic, Inorganic Chemistry):
Semester I

Class	Course title	Outcome
M.Sc. I (Organic, Inorganic and Analytical Chemistry)	CHP-110 Physical Chemistry	• Realize the terms ionic strength, activity coefficient, DHO equation. • Know the Eigen function, Eigen value, operator and postulates of quantum mechanics. • Learn two and three dimensional box, mechanics of particle. • Understand the adsorption of gases by solid type of isotherms • Recognized the Fricke and cerric sulphate Dosimeter.
	CHI-130 Inorganic Chemistry	• 1 Determine and Learn about Dipole moment and bond order ofThe inorganic molecule. • Learn about geometry and shape of the molecule. • Known the preparation and properties of transition metal carbonyls • To understand the 18 electron rule and its application. • Find out the point group of inorganic molecules. Learn molecular orbital and its orientation.
	CHO-150 Basic organic	• Learn SN1, SN2 and SNi Mechanism and stereochemistry

	Chemistry	• Learn classical and non-classical carbocation, • NGP by pi and sigma bonds. • Solve the elimination problems. • Distinguish between type of addition, elimination and substitution reaction • Learn E and Z nomenclature inC,N,S,P containing compound ,Stereochemical principal, enantiomeric relationship R and S.
	CHA-190 General Chemistry	Study the importance of safety and security, responsibility types ofhazards and risk in chemical laboratory. • Understand the use of personal protective and other safety equipments, handling of chemical in laboratory. • Understand the route of explores for toxic chemicals • Learn good laboratory practices and its applications

Course Outcomes of M.Sc I (Analytical, Organic, Inorganic Chemistry): Semester II

Class	Course title	Outcome
M.Sc. I (Organic, Analytical, Inorganic Chemistry)	CHP-210 Physical Chemistry	• 1. Learn the thermodynamic description of exact, inexact differential and state function. • Know the qualitative properties of solution, the depression in freezing point, elevation in boiling point and osmotic pressure.
	CHI-230 Inorganic Chemistry	• Understand the mechanism in transition metal complexes, Born Habercycle to calculate lattices energy. • Learn the use of catalyst, radius ratio rule of coordination number 3 • Study the structure of atom, Hunds rule, term symbol, calculation of microstate and selection rule.
	CHO-250 Name reaction ,synthetic Organic Chemistry and spectroscopy	• Study the various name reaction with examples. • Learn the mechanism of rearrangement reaction, use synthetic reagent of oxidation and reduction for solving the problems. • Understand the factors affecting UV-absorption spectra, Interpret IR spectra on basic values of IR-frequencies. • Discuss the problem of UV, IR and NMR.
	CHA-290 General Chemistry	• Study the instrumentation, sample injection system, columns forHPLC and GC, Solvent treatment system and choice of mobile phase. • Learn instrumentation of mass spectrometry, fragmentation, structure determination • Solve mean and standard deviation problems. Understand the accuracy and precision and classification

		error. • Learn distillation, solvent extraction, crystallization, and other separation techniques.
	CHP-107 Physical chemistry practical‟s	• Calculate molar and normal solution of various concentrations. • Determine specific rotations and percentage of to optically active substances by polorimetricall\ • Study the energy of activation and second order reaction. • Study the stability of complex ion and stranded free energy changeand equilibrium constant by potentiometry. Find out the acidity, Basicity and PKa Value on pH meter
	CHI-147 Inorganic chemistry practical‟s	• Study the gravimetric and volumetric analysis of ores and alloy. • Prepare a various inorganic complexes and determine its % purity. Preparation of nonmaterial.
	CHO-247 Organic chemistry practical‟s	• Perform the ternary mixtures, preparation of organic compounds, their purifications and run TLC. • Determination of physical constant: Melting point, Boiling point, different separation techniques.

Course Outcomes of M.Sc (Chemistry):
Semester III

Class	Course title	
M.Sc. II (Organic Chemistry)	CHO-350-Organic Reaction Mechanism	• Learn the reaction mechanism of nucleophile with elecrophile • Learn the acidity and basicity in organic compounds
	CHO-351-Organic Spectroscopy	• Understand the PMR and CMR values and their predictions • Understand the prediction of 2-D spectra
	CHO-352-Organic Spectroscopy	• Understand the 3-D way view of cyclohexane and related cyclic compounds • Learn to stereochemical principles with stereochemistry • Able to find out Cotton effect of different cyclic and acyclic molecules
	CHO-353-Photochemistry, Pericyclic and Heterocyclic chemistry	• Understand the electronic movements in thermal and photochemical excitations, their effects in reactions • Learnt about aromatic electrophilic and nucleophic substitution reactions involving variety of heterocycles such as prrrole, furan, thiophene, quinoline, isoquinoline, etc. In addition, various synthesis have been studied.
	CHO-347-Single Stage	• Get the idea about reaction set up • Understand the importance of purification techniques

	Preparation	recrystallisation during TLC and physical const. determination
M.Sc. II (Analytical Chemistry)	CHA-390 Electro analytical and radio analytical methods of analysis	• Study of colorimeter, Faraday 1st law, Faraday 2nd law. • Study of voltametry and paleographic method of analysis, • heterodynamic voltametry, plus paleography and cyclic voltametry. • Study of ampherometry and their application
	CHA-391 Pharmaceutical analysis.	• Study of apparatus for test and assay, cleaning of glassware, role of FDA in pharmaceutical industry. • Learn biological test and assay, microbiological test and assay, physical test, determination, limit test sterilization. • Analysis of vegetable drug, sources of impurities in pharmaceutical row materials and finished products. • Learn standardization and quality control of different row materials.
	CHA-392 Advanced analytical techniques	• Study the classical approach for aqueous extraction, solid phase extraction, micro extraction and SFE. • Learn: AAS, FES, ICPAES, and DCP. • Study atomic fluorescence, resonant ionization and LASER based enhanced ionization • Study of different detectors and their applications.
	CHA-380 Geochemical and alloy analysis and analytical method development and validation.	• To understand assay validation and inter laboratory transfer. • Study the statistical analysis and analytical figure. • Learn the analysis of geological materials and alloys. • Study the analysis of soil, sampling, chemical analysis as a measure of soil fertility
M.Sc. II (Inorganic Chemistry)	CHI-326- Organometallic Chemistry & Homogeneous catalysis	• Learn organometallic compound ,sigma-pi complexes,Fluxional behavior of for organometallic compound • Learn homogenous catalysis
	CHI-330- Inorganic Reaction Mechanism, photochemistry and Magnetic Properties of	• Learn photochemistry of compounds • Learn about Magnetic propreties of coordination compounds • Learn types of reaction in detail, intermediate formation, electron transfer reaction.

	Coordination Compounds	
	CHI-331 - Physical Methods in Inorganic Chemistry	• Learn Principles, Instrumentation &applications of TGA,DTA-DSC,CV. • Learn Mossbauer spectroscopy X-Ray Diffraction Powder &Single Crystal X-ray Photoelectron & ESR Spectroscopy.
	CHI-332- Bioinorganic & Inorganic medicinal chemistry	• Learn the various metalloenzymes of metals, structure &functions. • Learn the Radiopharmaceuticals, MRI contrasting agents, Leaching of metal by microorganisms

Course Outcomes of M.Sc II (Chemsitry):

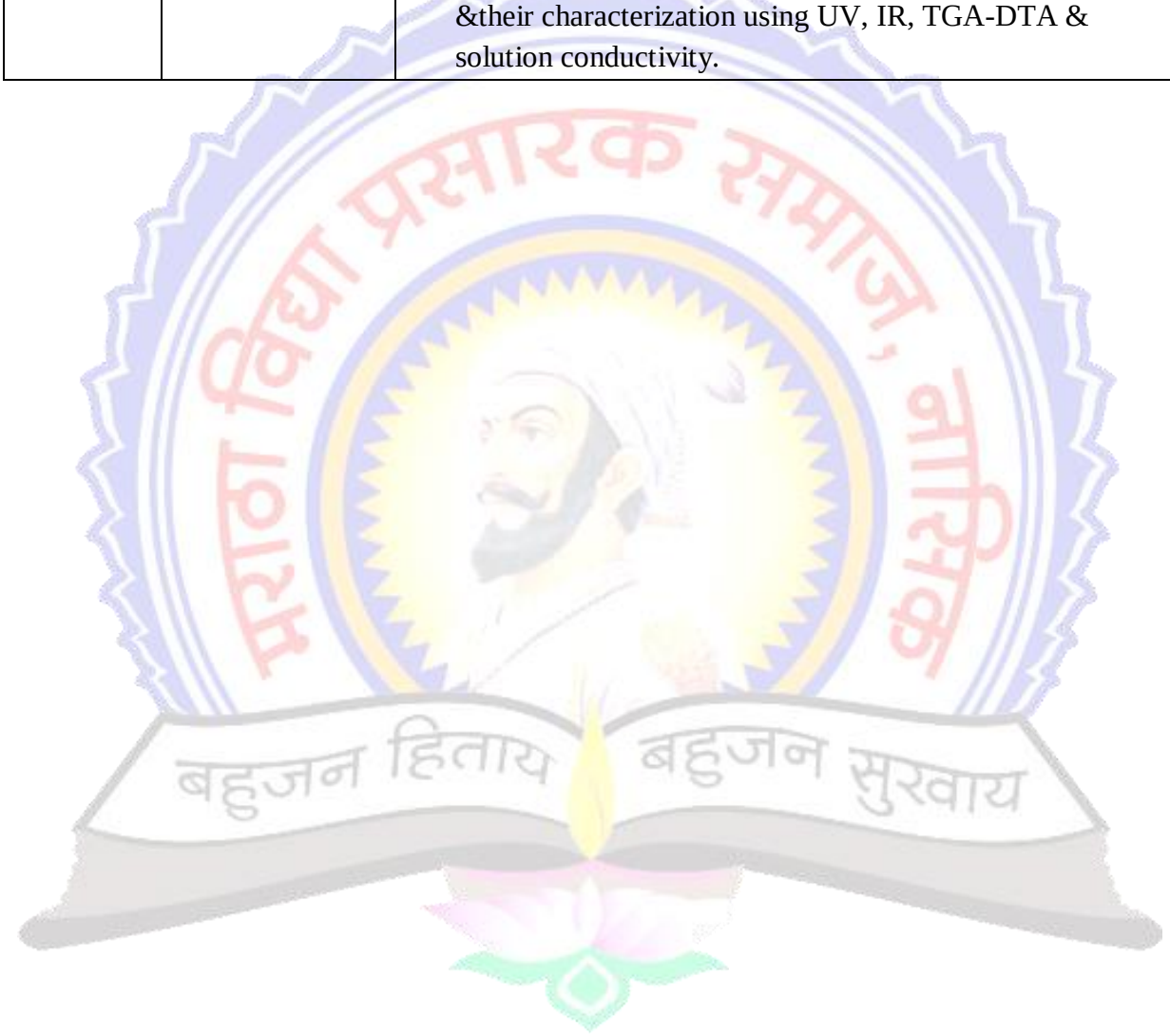
Semester IV

Class	Course title	Outcome
M.Sc. II (Organic Chemistry)	CHO-450- Natural Products	• Learn the idea of protection and deprotection for the synthesis of large, multistep organic compounds • Learn the use of naturally occurring small precursors for synthesis of big molecules
	CHO-451- Advanced Synthetic Organic chemistry	• Understand synthesis of C-C ,C=C bond formations using organometallic compounds • Understand the multicomponent reactions,click chemistry,importance of B and Si in organic synthesis
	CHO-452- Carbohydrates, Chiron approach and medicinal chemistry	• Learn the idea of protection and deprotection for the synthesis of multistep, large organic compounds • Learn the use of naturally occurring small precursors for synthesis of big drug molecules • iii) Importance of naturally occurred chiral precursors in medicinal and drug development
	CHO-453- Designing Organic Synthesis and asymmetric synthesis	• Learnt about the protection and deprotection concept in organic synthesis. Various protecting groups of hydroxyl, amine, ester, and aldehyde and ketones were studied. Also learnt about retrosynthetic approaches.
	CHO-447- Double Stage	• Get the idea about monitoring of organic reactions using TLC technique

	Preparation	• Understand about importance of quality of product by TLC and physical constant
	CHO-448-Green Chemistry/ Biochemical expts.	• Understand about the product purification by recrystallisation • Understand the importance of green reagents and methods in organic synthesis
M.Sc II (Analytical chemistry)	CHO-490 Analytical spectroscopy	• Study of ESCA, Detectors and their applications. Learn X-ray method of analysis, numerical problems. • Understand an introduction to microscopy, its applications. • Study of chemiluminescences, Fluorescence and phosphorescence. • Study of NMR spectroscopy
	CHO-491 Analytical methods for analysis of fertilizer detergent, water and polymer paint and pigments.	• Study of analysis of fertilizer, sampling and sample preparation, kjeldal‟s method. • Understand the analysis of soap and detergents, UV-spectroscopicanalysis of detergent. • Study of water pollution and analysis of polluted water
	CHA-492 Pollution monitoring and control and analysis of body fluid.	• Study of pollution monitoring, removal of heavy toxic metals Cr, Hg, Cd, Pb, As. • Learn the removal of particulate matters, SO2 And NOx. • Study the collection of specimen blood, urine, faeces. • Learn the analysis of blood and urine, Vitamin in body fluid. • Study the liver function and kidney function test.
	CHA-481 Analytical toxicology and food analysis.	• Study of acute poisoning, clinical toxicology. • Learn the isolation, identification and determination of narcotics, stimulants and depressants. • Study the classification function, analysis of carbohydrate, Protein,lipid. • Study the food preservatives, identification determination, and composition.
	CH-A-387 Analysis of materials	• Study the gravimetric and volumetric analysis of ores and alloy. • Prepare a various inorganic complexes and determine its % purity. • Preparation of nonmaterial. • To understand the chromatographic techniques. • Estimation of Iron By Various methods.

	CH-A-487 Instrumental Analysis	• Spectral analysis best on instrumental techniques • Photometric determination. • Study of Conductometer, FES, Polarography. • Analysis of riboflavin by photoflurometry. • To Study the spectroscopic techniques. • To study the terbidometry and Neflometry
	CH-A-488 Single stage preparations by Green synthesis.	• Study the dissolution of tablet. • Learn the spectroscopic techniques. • Study Volumetric and gravimetric estimation. • Analysis of Quinine sulphate by photoflurometry
M.Sc II (Inorganic chemistry)	CHI-430- Inorganic Polymers and Heterogeneous Catalysis	• Learn the Heterogeneous catalysis • Inorganic polymers,Heteropolyacids. • Application of Heterogeneous catalysis • Learn about Zeolites,, structure,function & applications
	CHI-431- Material science – I: Solid state and other Inorganic materials	• Learn solid state chemistry 2)Learn crystal defect, magnetic materials, superconducting materials, ceramic & composite materials, Biomaterial &cementetious material
	CHI-432- Materials Science-II: Nanomaterials	• Learn, Introduction,synthesis characterization,properties of Nanomaterials • Photochemistry and Electrochemistry of nanoassemblies, Nanoporous materials • Learn applications of nanomaterials- biological applications and as a sensor
	CHI-445- Inorganic Chemistry Applications in Industry, Environment and Medicine	• Learn Dyes and pigments • Learn Electrochemical applications • Learn applications of metal ions in medicine
	CHI-387- Experiments & computer applications in Inorganic Analysis	• Learn Analysis of alloys, ores, vitamin-c, cu-fungicide • Learn Flame photometric analysis • Learn Ion-exchange analysis • Learn Statistical analysis.
	CHI-388- Preparation of Inorganic	• Learn to Preparation & characterization of inorganic Metal complexes. • Preparation of Solid Materials, ferrites, oxides.

	compounds Metal complexes	• Learn to the study of Kinetics of Aquation reactions .
	CHI-488- Project work /Extended Practicals in Inorganic Chemistry	• Learn to preparation and purity of Metal complexes using Ligands : 1)DMG 2)8-hydroxy quinoline , 3)Salicylaldoxime ,4) Thiourea • Learn to structural determination of above complexes using following techniques like UV, IR, TGA-DTA,solution conductivity. • Project work: Synthesis of ligands and its metal complexes &their characterization using UV, IR, TGA-DTA & solution conductivity.



Department of Computer Science

Program outcome : B.Sc. (Computer Science) and B.C.A.(Science)	
1.	Train students in algorithmic and programming skills
2.	Build the necessary skill set for developing computer based solutions for real life problems.
3.	Develop problem solving abilities using a computer
4.	Provide quality software development practices.
5.	Create awareness about process and product standards
6.	Train students in professional skills related to Software Industry.
7.	Prepare necessary knowledge base for research and development in Computer Science
8.	Help students build-up a successful career in Computer Science

Program outcome :M.Sc. (Computer Science) and M.Sc. (Computer Application)	
1.	Impart the necessary learning skills and independence for further studies
2.	Can initiate and lead projects within the scientific field and be responsible for the work of individuals and groups
3.	Can communicate scientific information, challenges and findings to scholars as well as to general audience
4.	Are capable of presenting and describing scientific issues and research findings
5.	Can make decisions in an independent, professional manner and support
6.	Can make decisions in an independent, professional manner and support
7.	Are capable of developing software projects
8.	Will get ability to adapt team work

Program Specific outcome : B.Sc.(Computer Science) and B.C.A.(Science)	
1.	Demonstrate understanding of the principles and working of the hardware and software aspects of computer systems
2.	Design, implements, test, and evaluate a computer system, component, or algorithm to meet desired needs and to solve a computational problem

Program Specific outcome : M.Sc. (Computer Science) and M.C.A.(Science)	
1.	Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity
2.	Acquaint with the contemporary trends in industrial/research settings and

	thereby innovate novel solutions to existing problems

Course Outcomes of B.Sc. (Computer Science)

Class	Course title	Outcome
FYBSc(CS)	CS 101 Problem Solving using computer and C programming	• To develop Problem Solving abilities using computers with C programming
FYBSc(CS)	CS-102 File Organization and databases	• To teach basic organization of data using files and databases
SYBSc (CS) Sem-I		
SYBSc(CS)	CS-211 Data Structure using C	• To understand the different methods of organizing large amount of data in computer memory
SYBSc(CS)	CS-212: Relational Database Management System	• To teach database management operations
SYBSc (CS) Sem-II		
SYBSc(CS)	CS-221:Object Oriented Concepts using C++	• Acquire an understanding of basic object oriented concepts and the issues involved in effective class design with C++
SYBSc(CS)	CS-222:Software Engineering	• To teach basics of System Analysis and Design as well as Software engineering
TYBSc Semester-I		
TYBSc(CS)	CS-331 Systems Programming	• To understand the design structure of all system software such as compiler, linker, assembler, loader and editor.
TYBSc(CS)	CS-332 Theoretical Computer Science	• To have knowledge of turing machine, finite automata, context grammer
TYBSc(CS)	CS-333 Computer Networks -I	• Understand different types of networks, various topologies andapplication of networks
TYBSc(CS)	CS-334 Internet Programming I	• Learn web development programming language like PHP
TYBSc(CS)	CS-335 Programming in Java-I	• Understand core programming in Java
TYBSc(CS)	CS-336 Object Oriented Software	• Understanding importance of Object Orientation in Software engineering

	Engineering	
TYBSc (CS) Semester-II		
TYBSc(CS)	CS-341 Operating Systems	• To understand design issues related operating system and services
TYBSc(CS)	CS-342 Compiler Construction	• To understand design issues of a lexical analyzer and use of Lex tool, parser, and use ot yaac tool.
TYBSc(CS)	CS-343 Computer Networks -II	• Understand wired and wireless networks, its types, functionality of layer.
TYBSc(CS)	CS-344 Internet Programming II	• Learn advanced programming in web development
TYBSc(CS)	CS-345 Programming in Java-II	• Learn advance knowedge of java prorgamming
TYBSc(CS)	CS-346 Computer Graphics	• To learn concepts in graphics under Computer Programming
TYBSc(CS)	CS-347 Lab Course I System Programming & Operating System	• To design and develop system softwares
TYBSc(CS)	CS-348 Lab Course II Programming in Java	• To design and develop programs in Java languge
TYBSc(CS)	CS-349 Lab Course III Programming in PHP & Project	• To design and develop web based applications and projects

Course Outcomes of M.Sc.(Computer Science)

Class	Course title	Outcome
MSc (CS) Sem-I		
MSc (CS)	CS-101 Principles of Programming Languages	• Develop a greater understanding of the issues involved in programming language design and implementation
MSc (CS)	CS-102 Advanced Networking	• Develop advance knowledge of computer network
MSc (CS)	CS-103 Distributed Database Concepts	• To understand the principles and foundations of distributed databases
MSc (CS)	CS-104 Design and Analysis of	• Basic Algorithm Analysis techniques and understand the use o asymptotic notation

	Algorithms	
MSc (CS)	CS-105 Network Programming	• To develop prorgamming skill in computer network
MSc (CS) Sem-II		
MSc (CS)	CS-201 Digital Image Processing	• To understand concepts of image processing using various techniques
MSc (CS)	CS-202 Advanced Operating Systems	• Teaches Advanced Operating Systems Concepts using Unix/Linux and Windows as representative examples
MSc (CS)	CS-203 Data Mining and Data Warehousing	• To learn data mining and warehousing techniques
MSc (CS)	CS-204 Project	• The Project can be platform, Language and technology independent
MSc (CS)	CS-205 Programming With DOT NET	• To understand the DOTNET framework, C# language features and Web development using ASP.NET
MSc (CS) Sem-III		
MSc (CS)	CS-301 Software Metrics & Project Management	• Covers skills that are required to ensure successful medium and large scale software projects
MSc (CS)	CS-302 Mobile Computing	• To familiarize the students with the buzz words and technology of mobile communication
MSc (CS)	CS-303 Soft Computing	• To understand the concepts of how an intelligent system work and its brief development process.
MSc (CS)	CS-304 Project	• The Project can be platform, Language and technology independent
MSc (CS)	CS-305 Web Services	• To Understand Web Services and implementation model for SOA
MSc (CS)	CS-306 Database and System Administrator	• To acquire a combination of both Operating Systems & Database Administration skills
MSc (CS) Sem-IV		
MSc (CS)	CS-401 Industrial Training /Institutional project	• Explore knowledge at Industry during training and development

Department of Biotechnology

Program outcome : B.Sc. Biotechnology	
1.	Acquiring a strong base of all the concepts related to the life science and core biology.
2.	Developing a Scientific aptitude and a keen interest in the biological sciences helping form an evaluative decisions.
3.	Forms an Interdisciplinary approach by combining basic sciences with the advance technology.
4.	Understanding the need of world and thinking rationally to fulfill them in an environment friendly way.
5.	Applying the basics of biotechnology to day- to-day life and upliftment of society.
6.	Gaining skills to manage personnel, space, inventory and the technical equipments
7.	Compliance with safety and health regulations
8.	The objective is to prepare long term biotech professionals and researchers for advance research methodologies.

Program outcome : M.Sc. Biotechnology	
1.	Developing an interdisciplinary approach and a rational thinking.
2.	Improvising the technical skills and implying them
3.	Learning about a vast array of new products that are designed to enrich lives, make day-to-day living easier, and make us healthier.
4.	Designing of research projects that are cost effective, ecofriendly, potent and beneficial to mankind
5.	Use of scientific reasoning to make evaluative decisions
6.	Handling of sophisticated instrumentations and interpretation and analysis of data
7.	The objective is to prepare long term biotech professionals and researchers for advance research methodologies.

Program Specific outcome : B.Sc. Biotechnology	
1.	Acquiring through knowledge through theory and practicals
2.	Developing a deep rooted foundation at cellular, molecular, genetic and metabolic level.
3.	Making the agricultural practices easier through Plant tissue culture and Recombinant DNA technology.
4.	Knowledge of Biomolecules, their formation and interaction.
5.	Studying about Micro organisms, strain improvement for industrial applications.
6.	Inculcating good laboratory practices and safety.
7.	Learning various techniques and handling of laboratory instruments.

Program Specific outcome : M.Sc. Biotechnology

1.	To introduce to concepts in detail related to the Biotechnology and allied subjects
2.	To know the current research and implying knowledge of Genetic engineering,

	Plant Biotechnology and Agriculture Biotechnology and present new biotechnologies.
3.	Using various Bioinformatic tools for data collection, storing and accessing
4.	Understanding the Environment related issues and following bioethics and clean gene technology
5.	Use of common programs and algorithms to analyze data
6.	Learning about scientific writing and ethics in sciences.
7.	Improvising the communication and presentation skills

Course Outcomes of B.Sc. Biotechnology :

Class	Outcome
F.Y. B.Sc Biotechnology	• Biotechnology undergraduate curriculum caters primarily towards the basic of life sciences, integrating the biological concepts with the technology. • First year of the course is the foundation year wherein interdisciplinary approach is implied. • Courses like Fundamentals of Chemistry, Physics, Mathematics, Computers, Statistics, Biochemistry Microbiology, Plant and Animal Sciences are included in curriculum.
S.Y. B.Sc Biotechnology	• The Second year course integrates the living system and indulges towards the study at Cellular, Molecular, Genetic and Metabolic levels. • Integrating and the correlation between the subjects is developed. • The Developmental studies related to this living system are included.
T.Y.B.Sc. Biotechnology	• Advancement of course from molecular and cell biology to Recombinant Biotechnology, Plant and Animal sciences to Plant and Animal Tissue Culture, from environmental biology to biodiversity, from microbiology to bioprocess engineering, is done. • Handling of Sophisticated instrumentation, Good Laboratory Practices and safety are a part. • Theory supplemented with extensive practical skill help the student acquire a better knowledge related to subjects and prepare them for their Post graduations.

Course Outcomes of M.Sc. Biotechnology

Class	Outcome
M.Sc. I	• The course emphasis on application of basics in life sciences and recent technology. • Detailed and application oriented subjects are involved in the course. • Practical sets and protocols are formulated by students that inculcate scientific temperament which helps in analyses and interpretation. • Course also makes the students more environment sensitive and learning the approach towards sustainable development.

M.Sc II	• The master's in biotechnology degree allows students to enhance their knowledge through a specialized curriculum. • The course includes core as well as implies subjects that make the students ready for tomorrow. • They acquire knowledge of various implied subjects like Proteomics, Genomics, IPR, Bioinformatics, Stem cells and Medicine etc. • Projects make students imply core concepts/theory studied, analyse current research critically and using of scientific reasoning for evaluative thinking. • The projects undertaken are aimed to be cost effective, ecofreiendly, potent and coping with recent research. • The objective of course is to prepare long term biotech professionals and researchers for advance research methodologies.

Course Outcomes of BSc Biotechnology:

F.Y Biotechnology

Course title	Outcome
Bb - 101 Fundametntal of chemistry	1: To study the gaseous state, chemical kinetics , colligative properties and phase rule 2 : To get knowledge ionic equilibrium, electrolytic conductance and ionization constants of weak acids and bases 3 : to understand the principles of electrochemistry ,basics of stereochemistry with respect to representation of molecules, conformational isomerism. 4: to study chemical bonding and basics of organic chemistry-nomenclature, conformations, reactions and structure.
Bb-102 Fundamental of Physics	1:To study the physical quantities and its units and Dimensions, Conversions of units, 2:To study the properties of fluids and various methods to study the properties . 3:To understand the Waves And Oscillations and study its Applications in life sciences. 4:To study the Optical Properties, Reflection and Refraction due to lens and Mirror.
Bb - 103 Basics of Plant and Animal science	**Plant Science -** 1: Learn the plant groups and their characters with respect to increasing complexity in organization of plant body. 2: Understand features of Algae, Fungi, Bryophytes, Gymmnosperms, Angiosperms with their examples. 3: Study the morphology and anatomy of vegetative and reproductive plant organs. 4: Get knowledge of permeability, absorption and adsorption of water. 5. Study the major pathways of plant metabolism, essential nutrients for growth and development of plants and their roles. 6: Get knowledge of metabolism , movement and photo-morphogenesis of plant in vegetative phase.

	7: Know the physiology of flowering with respect to photoperiodism and vernalisation. 8: Study Plant growth regulators and their role. **Animal science-** 1: Understanding classification of Animalia family. 2: To study different types of animal tissues, their physiology, morphology,anatomy. 3: To understand various parasites and their life cycle. 4: To study various techniques of animal science beneficial economic point of view
Bb-104 Mathematics and statistical methods for biologists	**Mathematics:** 1 :To study the prerequisites of mathematics 2: To study complex numbers,sequences and series, partial differentiation, differential equations ,matrices and systems of linear equations, vector spaces **Statistics:** 1: To get knowledge of statistics with scope in biosciences, statistics as statistical data and data representation 2 : to understand population, sampling methods 3: to study descriptive statistics, probability, standard probability distribution ,testing hypothesis and correlation
Bb-105 Fundamentals of Biological chemistry	CO1- Study configuration and stereochemistry of bio molecules Study of types of bonds and strong and weak interactions CO2- Understand the concept of pH, pka, buffers, types of solutions, osmosis, and properties of water CO3- Understand the concept of free energy, Enthalpy, entropy, physical foundation of life CO4- Learn carbohydrate biochemistry which includes classification, structure biologically important functions CO5- Study lipids classification, physical and chemical properties of lipids and important biological roles 6 Study the hierarchy of protein structure, properties of amino acids, concept of zwitterion, methods of protein sequencing, and biological significance of proteins 7 Learn basics of enzymology, mechanism of enzyme action, enzyme classification, and inhibition 8 Study the structure and role of important vitamins and coenzymes 9 Study nucleic acid structures, their building blocks and nucleic acid stabilizing forces
Bb-106 Biophysics and instrumentation	1: To Understand the Historical background of Atomic structure, Different model on the basis of atoms, and understand the Quantum numbers. 2:To study the properties of Radioactivity and nuclear radiations, and study the applications of radiations in Biology. 3:To understand the Cell membrane and electrical properties related to cell membrane. 4:To study the Various Biological Processes Corresponding to Cell biology.
Bb-107 Microbiology	1. Understand the basic concepts of the development of microbiology with respect to various scientists and their inventions. 2. Develop fundamental knowledge about different classes / diversity of microorganisms. Understand the taxonomic classification of microorganisms

	3. Gets an idea regarding prokaryotic cell and its cellular arrangement. 4. Understand the basic concepts behind the experiment 5. Understand principle working and applications of microscope. To get introduce about the various staining techniques and stains. 6. Gathered the knowledge about the nutritional requirement of bacteria. Make students aware about the importance of preservation and maintenance of bacteria. 7. Familiar with various sterilization techniques to control the microorganism. Understand various specialized techniques such as pasteurization. 8. Gather the knowledge about the growth and reproduction of bacteria and their metabolism 9. Know the biodiversity and interactions of microorganisms with microbe and other higher organism
Bb-108 Computers and applications	1 : to study history and introduction to computer 2:To study modern computers, operating systems data processing and presentation and computer viruses. 3: To understand Computer networking internet searches, algorithms and flow charts and programming concepts and databases.
Bb-109 Practicals in Biochemistry	1Understand the concept of Molarity, Normality, methods of expressing concentration of solute, biochemical calculations Learn to prepare stock solutions and buffers 2 Isolation of specific biomolecules from plant source(Carbohydrate, protein and lipids) 3- Quantitative and qualitative estimation of proteins and carbohydrates 4 Analysis of enzyme activity 5 Learn chromatography separation technique and saponification of fats
Bb-110 Practicals in Physics and Biophysics and instumentation	1: To Measure the Physical quantities by using Vanier calliper, micrometer screw gauge, Spectroscope, measure the surface tension and Viscosity and Understand the diffraction of light by plane diffraction grating. 2:To study the Biological process by Osmosis, Diffusion pressure deficit and dialysis, To Understand the nuclear radiations by using G.M.Counter.
Bb-111 Laboratory exercises in Biosciences	1: Study Algae, Fungi, Bryophytes, Gymnosperms, Angiosperms with their examples. 2 : To study different parts of plants and cell types. 3: Determination of Diffusion Pressure Deficit, rate of respiration, Osmosis and Turgor pressure. 4. Develop the skill to stain the bacterial parts. 5. Screen the various types of microorganisms by different techniques. 6. Aware about the importance of aseptic technique. 7. Understand the basic concepts behind the experiment. 8. Demonstrate the soil community study using one column.
Bb- 112	1 : To analyze biological data and handling of computer.

Quantitative methods in biology	2 : To study scanning for viruses, word processing 3 : To study use of internet searching and surfing on www, spreadsheet applications, database applications and usage of multimedia

S.Y Biotechnology

Semester I

Course title	Outcome
Bb-211 Genetics and Immunology	1 : To understand the classical Medelian genetics 2: Knowing the gene interaction and multiple alleles. 3: Understanding the type of linkages and solving the problems related to mapping. 4: To understand the Pedigree, the symbols used and inheritance of disease. Solving the examples of Pedigree analysis 5: Understanding the mutation, types, causatives and Hot Spot mutations. 6: Have the knowledge about immunology types of immune system ,antigen and antibody , types of vaccines 7:Knowing the information about hypersensitivity ,types and significance
Bb-212 Cell Biology	1:To study the prokaryotic and eukaryotic cell as well as cellular diversity 2: Understanding the structure and function of subcellular organelles in detail 3: To distinguish between Mitosis and Meiosis process. Studing the Cell cycle in detail followed by its regulation and checkpoints involved. 4: To have knowledge about protein targeting and transportation. 5: Understanding about the cell junctions and the cell matrix required for adhering to cell. 6: Clear understanding of difference between apoptosis and necrosis pathway. As well as pathways for apoptosis.
Bb 213 Environmental Biology and Biotechnology	1: Understanding the Environmental components, Ecosystems and communities evolving and the factors which will affect those communities. 2: Study of different threats to ecosystem caused by heavy metals, toxins and its effect on Air,Water,Soil. 3: Awareness regarding different acts for protection of environment and biotechnological practices and treatments using microbes, plants, chemicals to solve environmental issues.
Bb 214 Practicals in Environmental Biotechnology	1: Studing different types of ecosystems by visiting them. 2: To observe different communities in different ecosystem and their sampling. 3: Quantifying amount of communities in a particular ecosystem. 4: Comparision of polluted and unpolluted soil to understand harm of pollutants on soil. 5: To understand effect of pollutants on water and the biological and chemical oxygen demand of aquatic organisms in water. 6: To study toxic effect of contaminated water on cell and genetic material of a biological specimen. 7: To study degradation of harmful pesticides by using micro-organism.

	8: To understand remote sensing software to locate different environmental areas.
Bb 215 Practicals in Cell Biology and Genetics	1: Solving the problems related to Mendalian inheritance, single and two point cross, epistasis, dominance, Linkage etc. 2: To study stages Meiosis and Mitosis in Tradescantia and Onion root tip.testing the effect of colchicine on Mitosis. 3: Study of Antigen -Antibody interaction, Haeagglutination, Replica plate technique, Blood cell types and Cell Lysis 4: To carry isolation of nuclei and mitochondria from liver tissue and their staining. Assay of mitochondrial SDH, 5:Observation and Staining of cheek epithelial cells and mitochondria

Semester II

Course title	Outcome
Bb -221 Molecular biology	2 :Gain information about prokaryotic and eukaryotic genome organisation,genes,intons and exons. 3: study Replication, transcription and translation process in prokaryotes and eukaryotes 4 : Have knowledge about genetic code Major scientific contributions to decipher genetic code, Concept of codon. 5: Learn DNA damage and repair mechanisms 6 :Undertstand the mecanisms of post translation modifications
Bb- 222 Animal & Plant Development	**Plant Development** 1: To study Unique features and principles of plant development at Cellular, organ and whole-plant levels. 2: To understand major phases of plant development at vegetative development till vegetative maturity and vegetative Pattern formation in plants, reproductive development and pattern formation in plants- flowering 3: Understand Microsporogenesis , Megasprogenesis, Double fertilization and triple fusion ,development of endosperm. 4: To study concept of competence, determination, commitment, differentiation, de-differentiation and re-differentiation. 5: To study Model systems to understand plant development and Programmed Cell Death- ageing and senescence, molecular regulation of development in *Arabidopsis.* **Animal Development** 1: To get knowledge of Gametogenesis: oogenesis and spermatogenesis 2: To study Types and patterns of cleavage, blastulation, Gastrulation in amphioxus, frog and chick. 3: To get knowledge of organogenesis in frog, chick. 4: To know concept of stem cells, Progenitor cells, cell lineage determination, commitment and differentiation, Concept of dedifferentiation, redifferentiation, transdifferentiation and regeneration. 5: To know Role of genes in patterning and development of *Drosophila,* Ageing and apoptosis, Abnormal development and teratogenesis in animals.
Bb-223 Scientific Writing and	1: To be able to give an oral presentation using the guidelines taught. 2: To be able to use new words in conversation and with enrichment in vocabulary.

Communication	3: To converse fluently using correct grammar. 4: To be able to effectively write down about a related topic. 5: To understand use the thesaurus and dictionary as and when needed. 6: Write their curriculum vitae to avail job opportunities after finishing their education. 7: To design experiment in a particular area of research. 8: Able to make effective presentations of different types on a topic of interest. 9: Understand the format of a research article to publish in a journal 10: Able to write an abstract of a given research article or for an original article. 11: Should be able to identify a relevant area of research and carry out literature survey for the existing work done in that area. 12:Write a good research article particularly the section of Materials and Methods 13: Able to show results effectively in the form of tables, graphs, figures etc. 14: Able to write an effective discussion after analyszing the results and comparing it with peer research groups. 15: Have an understanding of the citation systems and use them properly in their thesis or dissertation. 16: Understand the importance of usage of proper language and overall assessment of the paper for minimum editing.
Bb-224 Metabolic Pathways	1: To understand the principles of bioenergetics in relation to biochemical reactions in cell. 2: To understand working of enzymes their kinetics and their regulation. 3: Understand the concept of anabolism and catabolism 4: Write the pathways for carbohydrate metabolism with structures. 5: Understand the reactions in oxidative and photophosphorylation. 6: Write the pathways of lipid metabolism with structures. 7: Write the pathways of protein metabolism with structures.
Bb-225 Practicals in Molecular Biology	1: Understand the importance of clean handling, sterility, cleanliness and lab safety. 2: Study the preparation of different reagents and their roles in different practicals 3:Isolation of DNA from bacterial cell and from eukaryotic cell (plant /animal cell) and determination of its purity 4 : Analysis of isolated DNA by Agarose gel electrophoresis technique. 5 : To study comparative protein estimation by Biuret, Lowry and Bradford's method 6 :To study SDS-PAGE technique for separation of proteins and staining and distaining of protein gels to analyze separated proteins.
Bb-226 Practicals in Developmental Biology	**Plant development** 1: To study Methods of plant development, apices and meristem. RAM, SAM, florally induced meristem, Development of male and female gametophytes. 2: To study developmental stages during plant embryogenesis in dicots and monocots dissection of seed and excision of young embryo and

	endosperm. **Animal development** 1: Study of different types of eggs, frog development, observation of frog embryos, different development stages, life cycle , Study of amphioxus development 2: Study of staging & staining of Chick embryos 3: Study Chick embryo culturing 4: To study effect of teratogen on development of chick embryo

T.Y Biotechnology

Semester III

Course title	Outcome
Bb 331 Microbial biotechnology	1. Introduce about history of microbial Biotechnology and its future. 2. Understand the microbial growth and its kinetics by Monad equation. Get an idea about the physicochemical requirement of bacteria for their metabolism 3. Gathered the knowledge about the immobilization process, biosensors and biochips. 4. Understand the various qualitative and quantitative analysis techniques for food and dairy products. Understand the importance of microorganism in food and dairy industry as well as the production of products. 5. Acquired with the theoretical concept behind the analysis of quality 6. Gathered the knowledge about various application of bacteria in geomicrobiology.
Bb-332 Plant and Animal Tissue Culture	**A. Plant Tissue Culture:** 1: Understand Cell theory & Cellular totipotency, Landmarks in plant tissue Culture, Infrastructure & organization of plant tissue culture laboratory. 2: Study nutritional requirements of the explants, PGRs and their *in vitro* roles, media preparation. 3: Study different plant tissue culture techniques, Callus culture technique, Suspension culture technique, Organ culture technique, Anther & pollen culture, Ovary, ovule, embryo and endosperm culture. 4: Understand isolation, culture and fusion of Protoplast, concept of Somaclonal variation 5: To give an extended knowledge about applications of plant tissue culture **B. Animal Tissue culture** 1: To understand difference between bacterial culture and animal culture, Concept of monolayer, suspension, histotypic/ organotypic, organ culture And maintenance of aseptic conditions. 2: Get knowledge of Equipment and infrastructure , Nutrition & Physiology of animal tissue culture. 3:Get detailed knowledge of Primary cell culture, Cell lines Characterization of cell lines. 4: Study Cell storage and distribution,cryopreservation, cell repositories. 5: Gain the knowledge of application of animal cell cultures.

Bb 333 Biodiversity and Systematics	1: Understanding the concept of Biodiversity, taxonomic, ecological and genetic perspective of biodiversity. 2: To study different Biomes in world, Concept of Habitat and niches, Niches segregation. 3: To study the Behaviour pattern in animals- Innate as well as Adaptive 4: Understanding of population interactions, Growth forms, Age class distribution etc. 5: To know the status of Biodiversity and need for conservation, types of conservation strategies. 6: Understanding the concept of species, mechanism of speciation and types. CO7:Important tools and techniques that are used in systematics.
Bb-334 Tissue Culture techniques	1: To get knowledge of ATC laboratory design and equipment used in ATC, Aseptic conditions, Animal cell culture media preparation, sterilization, washing, packing, Observation of cells in culture. 2: Study Isolation of Lymphocyte for culture, Maintenance of cell lines, Cell staining methods, Viable cell count and growth studies of animal cell culture. 3: To get knowledge of PTC Laboratory, Aseptic manipulation, Stock solutions & media preparation. 4: Study different tissue culture techniques, Callus culture technique, Suspension culture technique, Effect of plant growth regulators 5: To know Initiation of shoot tip & axillary bud culture. 6: To study anther and embryo culture.
Bb 335 Microbial biotechnology	1. Analyze the effect of various environmental factors on the growth of bacteria. 2. Study the growth curve of *E.coli*. 3. Check the quality of milk with respect to pasteurization and disease (mastits). 4. Evaluate the different parameters required for the potable water. 5. Introduce industrial level analysis of waste water treatment and the effluent treatment.

Semester IV

Course title	Outcome
Bb- 341 Large Scale Manufacturing Process (LSMP)	1. Understand the concept behind the fermentation with its types. To get an idea about Bioprocess Engineering. 2. Understand the importance of primary and secondary screening. Understand the taxonomic classification of microorganism. 3. Get an idea about the construction of bioreactor from basic to advance type. 4. Gathered the knowledge of media optimization and its importance with two important design. 5. Understand the implementation techniques required for small scale and large scale manufacturing. 6. Get an idea about different standard techniques used for quality control and quality assurance. 7. Understand the relation between product and its market importance.

Bb-342 Biochemical and Biophysical Technique	1: Understanding lab safety, scientific units and notations, preparation of different buffers, concentrated solutions. 2: Study different types of microscopes and different specimen preparation for different microscopes. 3: Study of instrument spectrophotometer which is used for quantifying concentration of solution, principle on which it works and its types. 4: Study of an instrument (Centrifuge) used to separate mixture of molecules, its principle and types. 5: To understand and study Biophysical technique Chromatography and its type for the separation of different biomolecules. 6: Study of separation techniques for nucleic acid and protein and its type.
Bb 343 Recombinant DNA Technology	1:Studying the milestones of Genetic Engineering 2: To study the molecular tools and Vectors those used, Restriction mapping. 3: To study techniques of transformation, their selection and characterization. 4: Nucleic acid isolation, purification, yields analysis etc. 5:To study DNA sequencing methods, PCR and its types. 6: To understand Southern and Northern Blotting techniques. 7: Knowing Site directed mutagenesis, Construction of Genomic and cDNA library,DNA Fingerprinting. 8: To know various applications of Genetic Engineering and Bioethical issues.
Bb 344 Techniques in Recombinant DNA Technology	1: Isolation of bacterial, plant and animal genomic isolation, its purity estimation, quantification. 2:To study DNA Ligation ,DNA restriction and digestion 3: To prepare and understand agarose gel electrophoresis. 4: To understand the preparation of competant cells and to carry out their transformation and selection. 5: To understand the various Blotting techniques: Southern and Western. 6: Understanding the PCR reaction and operation of thermocycler.
Bb- 345 A Practicals in Large Scale Manufacturing Process (LSMP)	1. Screen the bacteria for organic acid and antibiotic production. 2. Isolate the mutants. 3. Check the sensitivity of antibiotic towards susceptible bactgeria. 4. Experiment on the production of different commercially important products like wine, antibiotic, citric acid.
Bb – 345 B Practicals in Biochemical and biophysical technique	1: To understand rules and safety regulations while working in laboratory, preparation of solutions used in practicals. 2: To study various biophysical and biochemical technique for separation and quantification of biomolecules. 3: Visiting to a research laboratory and demonstration of the instruments like HPLC, GC.

Course Outcomes of M.Sc Biotechnology:

Semester I

Course title	Outcome
BT-101 Advanced Biological Chemistry	1: Able to discuss the structure and function of different important biomolecules in a cell like carbohydrates, lipids and proteins. 2: To understand the primary, secondary and tertiary protein structure. To understand aspects of protein modification and degradation. 3: To gain knowledge of the disorders of metabolism related to different biomolecules. 4: Understand to potential in the field of metabolomics for strain improvement. 5: Able to discuss about different classes of secondary metabolites in plants. Study the different applications of metabolites. Understand the pathways for production of secondary metabolites in plants.
BT 102 Molecular biology	1 : Understand the genome structure and organization in prokaryotes and eukaryotes, histones and their effect on structure and function of chromatin, concept of gene families, clusters, pseudogenes, genome complexity and renaturation kinetics of genome. 2: Understand the process of DNA replication in prokaryotes and eukaryotes and models for replication. 3: To study DNA damage and Repair -types of DNA damage and DNA repair mechanisms- nucleotide excision repair, base excision repair, mismatch repair, recombination repair, double strand break repair. 5: Study about Recombination Homologous and site-specific recombination, models for homologous recombination- Holliday junction, NHEJ, Proteins involved in recombination. 6 :Study about gene expression in prokaryotes and eukaryotes Regulation of transcription including transcription factors. Post-transcriptional processing and transport of RNA. 7: Mobile DNA elements(transposable elements) in prokaryotes(IS elements, composite transposons) and eukaryotes (TnA and Tn 10 transposition). 8: Understanding the concept of Protein Synthesis, Modifications and Transport Mechanism of protein synthesis, Regulation of protein synthesis, Post translational modifications.
BT 103: Environmental Biotechnology	1: To understand Threats to Environment, Air Pollution Monitoring, Soil Pollution, Solid waste Sources and types, Water pollution, 2: To study Biotechnology in Remediation ,Types of Bioremediation. 3: To study Phytoremediation, Bioaugmentation, Biostimulation 4: To know Environmental Laws and Policies. 5: To understand Remote sensing and Environmental Auditing. 6: To understand Environmental Impact Assessment and Environmental

	Audit.
BT 104: Cell Biology	1 :Study Cell structure and cytoplasmic membrane system Cell structure and function with inter relationship of cell organelles and energy transformation,transport across plasma membrane and intra-cellular transport. Cell membrane – Plasma membrane types (animal, plant and bacterial) 2 : Understand the cell signaling: communication between cells and environment , function of second messengers Signaling at cell surface, signaling molecules, hormones and receptors signaling pathways that control gene activity 3 :Understanding the mechanism of cell differentiation, cell death, cell transformation Cell Cycle and its regulation,Cell differentiation in plants and animals including terminal cell differentiation Role of hormones and growth factors Programmed cell death Cell transformation and etiology of cancer. 4 : Study the Structure of Plant Cell, Plant cell wall - primary and secondary structure and function Plastids - biogenesis, structure and types
BT-105 Exercises in Advanced Biological Chemistry	1: To purify proteins by the different methods taught in the practicals. 2: To study the enzyme kinetics of enzymes and correlate it with their applications. 3: To study any plant wrt its secondary metabolites, their extraction and applications.
BT 106: Exercises in Molecular and Cell Biology	1 Isolation of chromatin, histones and nuclei 2 Isolation of RNA 3 To understand and interpret electron micrograph 4 Study various plant various tissue explants (xylem vessels, tracheids, stomata, root hair) 5 Study of programmed cell death in chick embryo 6 Organelle isolation (Mitochondria and Lysosomes)
BT 107 Exercises in Environmental Biotechnology	1: To study Isolation of microorganism from polluted soil. 2: To know Genotoxicity assay of polluted water 3: To understand Estimation of TSS, DO, BOD and COD of waste water 4: To understand Acquisition of "Google Earth" images 5: To understand estimation of biodegradation of pesticide/insecticide/fungicide. 6: To get knowledge of EIA.

Course Outcomes M.Sc Biotechnology:

Semester II

Course title	Outcome
BT – 201 Genetic Engineering	1: Understanding various tools in genetic engineering like enzymes, vectors used for preparing a recombinant. 2: To study various strategies useful to produce high quality and quantity of biomolecules used in industrial prospective. 3: Study of different techniques and methods useful in genetic engineering for preparing a recombinant. 4: To study application of various tools and techniques studied in genetic

	engineering for detection or diagnosis of disease, criminology, preparing vaccines, transgenic models.
BT- 202 Immunology	1: To be able discuss the immune cells and organs with their functions in defence. 2: Understand the concept of protective and destructive immunity. 3: Compare and understand the importance of complement system in immune defence. 4: Understand the utility of antigen antibody interaction to make diagnostics. 5: discuss the types of hypersensitivities and its therapy. 6: discuss the role of different factors in Autoimmunity. 7: Able to understand the problems faced in transplantation . 8: Discuss the role of immune system in parasitic infections. 9: Conceptualize antibody engineering as a tool. 10: To know the available animal models for immunological study. 11: to discuss designing of new vaccines. 12: Conceptualize and design the manufacturing of new immunodiagnostics.
BT- 203 Principles of Bacteriology and Virology	1: To be able discuss the procaryotic cell structure and its applications in designing drugs. 2: To isolate and culture any bacteria of interest and identify. 3: Compare and understand the role of bacteria in public health and biotechnology applications. 4: Understand the properties of viruses and their morphology. 5: discuss the different classification system of viruses. 6: understand the mechanisms of viral genome replication. 7: know the methods involved in studying of viruses their cultivation and pathology. 8: Discuss the different antiviral agents with their mode of action. 9: discuss the types of infective viruses. 10: To understand the field of epidemiology and its applications. 11: concept of immunopathogenesis 12: Awareness about the new emerging diseases and how to tackle with them . 13: Able to know different animal and poultry viruses which is of importance in animal husbandry. 14: study plant viruses with the knowledge of their pathogenesis
Bt 204 Plant biotechnology	1 : To study algal and fungal biotechnology 2 : to get knowledge of micro propagation, in vitro androgenesis, somatic hybridization 3: To study transgenic plant production through various biotechnological techniques
BT – 205 Exercises in Genetic Engineering	1: To study techniques for engineering or modification of genetic material by isolating the genetic material, cutting (restricting), joining (ligating), and transforming the genetic material. 2: To study different techniques for amplification, hybridization and analysis of the engineered genetic material
BT-206 Exercises in Immunology	To be able to perform and interpret the different immunodiagnostic tests for detection of antigens or antibodies. To be able to understand the manufacture of immunodiagnostics in detection of diseases.

BT 207 Exercises in Plant Biotechnology	1: To know the culturing of algae and biochemical analysis of products from it. 2:To Understand in vitro induction of somatic embryogensis 3: To know Micropropagation and study its different stages. 4:To know the methods and different sources of protoplast isolation 5:To understand cell suspension culture and growth analysis 6: To go for Haploid plant production via androgenesis
BT-208 Exercises in Bacteriology and Virology	To obtain the microbiological skills of handling equipments and microorganisms for identification and applications. To be able to isolate any bacterial species and identifying upto genus level. To study animal and bacterial viruses by basic techniques.

Course Outcomes of M.Sc Biotechnology:

Semester III

Course title	Outcome
BT- 301 Animal Biotechnology	1: Study of animal tissues, different precautions and preventions to be taken, medias to be used to artificially culture animal cells. 2: To study various types of culturing techniques of animal cells. 3: Understanding various features of animal cells and its response to various factors. 4: Study of techniques of measuring, separating, freezing, transporting animal cells. 5: To study applications of these animal cells in drug testing, stem cell technology, transgenics, studing genetic disorders. 6: To study techniques used for characterization of genome of these cultured animal cells.
BT-302 Bioprocess Engineering and Fermentation Technology	1: To discuss basic aspects of fermenter design, how they work and the concept of mass transfer. 2: To design fermentation media and its steriliation. 3: To design a protocol for strain improvement. 4: To optimize the process for large scale production of industrially important compounds.
BT 303 Database Management and Intellectual Property Rights	1 Learn the types of databases relevant to Biotechnology 2 Learn the Principals of Data Management and data mining 3 Understand the importance of organization and characterization of databases andapplication of databases with examples 4 Learn the concept of Intellectual Property Rights, Tools of IPR-Introduction and types 5 Understand the concept of Treaties, Conventions, Laws, Acts and agreements 5 Understand the concept of Patents, prerequisites for patenting, Process patents and Product patent with relevant case studies 6 Study the Indian and International scenario in context of patenting 7 Study the law regarding protection of plant varieties and plant breeders rights 8 Study the gadgets used in biotechnology
BT 305	1 Understand biological databases and their applications, homology

Bioinformatics	search, multiple sequence alignment and gene annotation 2 Learn methods of molecular modeling, retrieving and visualizing protein structure, molecular simulations Methods of phylogenetic analysis to infer genetic relatedness 3 Understand the structure function relationship of proteins, Ramachandran plot 4 Learn the concept of protein motifs and methods of domain prediction, applications of Hidden Markov Model and immunoinformatics
BT- 306 Exercises in Animal Biotechnology	1: Study of initiation of animal cells artificially in laboratory environment aseptically (invitro) and to maintain them and preparing chromosome from cells. 2: To analyse the cell growth by counting the viable cells and studing its effect
BT 307 Exercises in Bioprocess Engineering	To isolate an efficient strain for production. To optimize media for production of industrially important molecules. To handle lab scale fermentation system. To design solid state fermentation for production of metabolite.
BT 308 Exercises in Bioinformatics	1 Explore different biological databases, and learn retrieval of sequences from databases Sequence analysis by: BLAST, and FASTA 2 Learn Multiple sequence alignment of proteins and nucleic acids 3 Learn Phylogenetic tree construction methods(Phylip, FIGTRE) 4 Study methods of protein structure visualization, potential energy calculation and energy minimization 5 Learn protein classification,domain identification, relevant databases (PFAM, Prodom, Prosite) 6 Explore immunoinformatics database and its applications
BT309 Seminars and Term Paper Writing	CO1: To increase stage daring. CO2: To improve scientific writing skills. CO3: To gather the knowledge of various subjects of life sciences.
BT 310 Scientific Research and Communication	1: To be able discuss the history of scientific research. 2: To understand about data collection and analysis. 3: Understand the different types of research methodologies. 4: To be able to apply statistical tools to the data obtained during research. 5: To understand the importance of scientific ethics and follow rules of plagiarism. 6: understand the different modes of data presentation and scientific paper writing. 7: To understand the methods of filing patents in research.

Course Outcomes of M.Sc Biotechnology:

Semester IV

Course title	Outcome
BT 401 Genomics and	1 Study basic concept of genomics, structural, functional genomics, whole genome sequencing using next generation sequencing

Proteomics	technologies, genome mapping and comparative genomics 2 Study the RNA expression profiling and transcriptome sequencing Methods to study transcriptome (EST,SAGE and microarray) Applications 3 Learn the application of genomic and transcriptomic resources in basic research, medical genetics, Metagenomics, Toxicogenomics Pharmacogenomics 4 Learn the basics of Proteomics and its applications Expressional Proteomics and Functional Proteomics 5 Learn the methods used in proteomics (Mass spectrometry, Protein Microarray), bioinformatics tools for proteomics, protein separation techniques (2D gel electrophoresis, isoelectric focusing) 6 Study the applications of proteomics and toxicoproteomics
BT 403 Exercises in Biochemical and Biophysical Techniques	To be able to understand the different techniques for studying of biomolecules like protein, DNA, antigen, antibody etc. To understand the use of special techniques for biomolecule isolation and purification.
BT 405 Animal Development and Stem Cell Technology	1: To be able discuss the process of gametogenesis. 2: Discuss metabolic activation of egg. 3: Compare and contrast cleavage patterns in different systems. 4: correlate the cell cell interaction for development processes. 5: concept of fate maps 6: understand the neurulation and neural crest as the fourth germ layer. 7: underlying molecular principles of animal development. 8: understand the cellular basis of differentiation. 9: understand concept of stem cells and their importance. 10: To write pathways influencing stemness. 11: concept of stem cell lineage and methods for studying it. 12: Know the methods and protocols in stem cell isolation and characterization. 13: importance of IPSc in stem cell technology. 14: know different types of adult stem cells. 15: Understand the role of stem cell in tissue engineering for various applications. 16: Know the different methods involved in stem cell manipulation. 17: Discuss the pros and cons of stem cell applications from ethical point of view.
BT 406: Agricultural Biotechnology	1 :To understand the importance of biotechnological techniques for quality improvements in different agricultural crops 2 : Study the use of bioreactors in plant production & Scale-up, molecular markers and marker assisted selection for crop imprvement with case studies, Importance of virus indexing technique 3:Transgenic techniques in crop improvement ,mechanisms for genetic improvement of crops to achieve production of commercially important products such as vaccines antibodies,etc. and concept of future crops. 4 : Understand Case studies in agro-biotechnology –one each from a) cereal, b) pulse, c) oil seed d) ornamental e) vegetable

	for gaining the knowledge of currently grown agronomically important crops that are biotechnologically improved through various techniques Agricultural biotechnology and agribusiness.
BT 407 Project	To do literature survey of the topic of research. To design experiment for the research.

Department of Environmental Science

Program outcome : B.Sc. (Environmental science)	
F.Y.B.Sc. (Semester I)	
EVS111 Fundamental of Environmental Biology	• Understand the biosphere and biotic community • Appreciate physiology of plants and animals, and relation with environment • Appreciate the Climatic factors, stress and physiology • Critically examine the impact of human action on the biological environment
EVS112 Fundamental of Environmental Chemistry & Physics	• Comprehensive understanding of the concept of atom, electronic configuration, periodic properties and bonding • Comprehensive understanding acid-base concepts, neutralization, and buffer and buffer capacity
EVS113 Environmental Science Practical Paper	• Basic understanding on plant and animal physiology • Measurement of chloride, alkalinity, hardness of water • study of various animal and plant forms • study of plants and animal diseases
F.Y.B.Sc. (Semester II)	
EVS121 Fundamental of Environmental Geosciences	• Should be able to describe the composition and vertical structure of atmosphere. • Should have understanding of the clear distinction between adiabatic lapse rate and the environmental lapse rate and be able to work out temperatures at higher altitudes based on the lapse rate. • Should know how geostrophic winds and cyclones are caused in the earth atmospheric system
EVS122 Fundamental of Environmental Pollution	• Knowledge on the types and the science of environmental pollution • Appreciation of the effect of polluting on human health • Analytical ability to link cause and effect of pollution • Critical issues of handling pollution vis a vis human beings • Ability to develop pollution mitigation/abetment strategie
EVS123 Environmental Science Practical Paper	• Field visit and reporting – Recording bio-complexity at field level (Relationships within plants, animals and between plants and animals in the ecosystem. • Understanding and comparing noise levels of localities • Visit to a local polluted site-Urban/Rural/Industrial/ Agricultural, sampling, analysis and reporting • Visit to a Natural Area/ Wildlife Sanctuary/ National Park

SYBSc (Semester I)

SYBSc-(Paper-I)	EVS – 201 Ecology & Ecosystem.	• Knowledge on ecology, and ecological dynamics • Ability to correlate ecological dynamics and regulation of vital processes on earth as biogeochemical cycles • Ability to interpret ecosystem services, ecological resilience, ecological economics, and landscape ecology • Set up experiments to appreciate concepts of Ecology • Critically examine the forces impacting ecosystems viz., climate change, stress, population, consumerism, globalization, land use change
SYBSc (Paper-II)	EVS – 202 Natural Resources, Energy & their Management.	• Appreciate attributes of natural resource use and management • Understand the complexity of natural resource and issues, and sustainability • Apply theories and methods with interdisciplinary approach towards natural resource management • Critically examine the gap in the resource availability, use, and conservation

SYBSc (Semester II)

SYBSc (Paper-I)	EVS – 201 Biological Diversity & its Conservation.	• Systematically understand biodiversity and its vital role in ecosystem function • Appreciate the need of biodiversity conservation in the context of various developmental pathways and policy framework that the mankind has been undergoing • Identify the importance of biodiversity in natural environments • Critically examine biodiversity and human linkages, and help policy formulating for conservation
SYBSc (Paper-II)	EVS – 202 Pollution Control & Environmental Technology	• Knowledge on the types and the science of environmental pollution • Analytical ability to link cause and effect of pollution • Ability to develop pollution mitigation/ abetment strategie • Identify the case specific issues related to pollution • Apply understanding to generate recourses from wastes
SYBSc (Paper-III)	EVS – 203 Practical Course Based on EVS - 201 & EVS - 202	• Field visit and reporting – Recording bio-complexity at field level (Relationships within plants, animals and between plants and animals in the ecosystem. • Assessment of biodiversity in a given geographical area – floristic diversity (citing categories of different life forms based on morphological features only).

		• Quadrat study for plants (1m× 1m), involving random sampling to random sampling to measure the abundance, density and frequency of various species in an ecosystem. • Analysis of nitrate , sulphate in samples. • Sampling of Atmospheric Dust by Gravity Settling to measure the rate of Dustfall. • Determination of Optimum Dose of Alum (Coagulant) required for water.

TYBSc (Semester I)

TYBSc (Paper-I)	ENV-301 Terrestrial Ecosystems and Management	• Understand the biosphere and biotic community • Understand terrestrial ecosystem their pattern • Understand impact of human action on soil and land • Critically examine the issues of Soil and Land in the environmental perspectives • Apply knowledge in land conservation projects
TYBSc (Paper-II)	ENV-302 Wildlife biology	• Understand basic ecological principles (the interconnectedness of organisms to each other and their environment) to environmental problems and sustainability issues. • Articulate fundamental concepts in wildlife conservation and management • Apply understanding of cultural, historical, and current perspectives on the human wildlife relationship to effectively address wildlife issues. • Be capable of assessing status of wildlife and biodiversity
TYBSc (Paper-III)	ENV-303 Water Quality	• Select the sources of water for various water uses • Identify the data requirements for water resources and interpret the analysis of the same • Critically examine water resource management systems interaction and significance with respect to the environment
TYBSc (Paper-IV)	ENV-304 Issues in Environmental Science	• Develop a critical understanding of the physical environment and social environment • Apply understanding of Bio-resources and their impact on local economy. • Study Environmental Movements: Genesis of global environmental movement, Chernobyl disaster • Citizen participation and representation in environmental issues The national environmental advisory forum Access to environmental information

TYBSc (Paper-V)	ENV-305 Environmental Governance and Equity: Law and ethics	• Understand the Indian constitutional provisions with respect to the environmental protection, division of powers, and fundamental rights • Appreciation of forest and wildlife laws and environmental laws relating to social justice (Forest Dwellers' Act of 2006; The Biodiversity Act of 2002) • Comprehensive understanding of pollution control laws (The Water Act, The Air Act and the Environment (Protection) Act of 1986), and rules • Functional understanding of international Environmental laws (Treaties and Protocols), and Indian commitments • Appreciate some case studies of environmental litigation
TYBSc (Paper-VI)	ENV-306 Environmental Biotechnology-I	• Knowledge on scope of biotechnology in environmental applications • Knowledge of microbiology and biochemistry • Ability to perform various molecular biological applications, and knowledge of equipment used in molecular biological techniques • Ability to apply molecular biological techniques in pollution management and industrial applications • Knowledge of advanced biotechnological applications, and biosafety in analytical procedures

TYBSc (Semester II)

TYBSc (Paper-I)	ENV-301 Aquatic Ecosystems and Management	• Knowledge of Aquatic sources and processes involved • Estimate the design parameters of a aquatic resources system using elementary methods • Critically examine aquatic resource management systems interaction and significance with respect to the environment • Application of knowledge on aquatic resources and management.
TYBSc (Paper-II)	ENV-302 Nature Conservation	• Apply understanding of cultural, historical, and current perspectives on the human wildlife relationship to effectively address wildlife issues. • Identify the primary international, national, and state agencies and scientific organizations, responsible for conservation and management of wildlife, and understand the role of private citizens in decision-making at all levels. • Appreciate current threats to biodiversity in relation to protected areas and non-protected areas

		• Make informed decisions about wildlife conservation and management by critically evaluating information sources
TYBSc (Paper-III)	ENV-303 Air and soil Quality	• Understand principles of land management • Understand impact of human action on soil and Air • Critically examine the issues of Soil and Air in the environmental perspectives • Apply knowledge in water and Air pollution controlling / management projects
TYBSc (Paper-IV)	ENV-304 Issues in Environmental Science	• Develop a critical understanding of the physical environment and social environment • Ecological conflicts and the environmental movements in India • Appreciate Use of computer in environmental health modelling, environmental health modelling, Resource management by Remote sensing & GIS • Understand environmental rules and regulation, agenda related environment conservation
TYBSc (Paper-V)	ENV-305 Environmental Governance and Equity: EMS, ISO 14000	• Develop a critical understanding of the ISO and the environment • Understanding ISO 14000 family of standards • Understand Environmental audits, Compliance and governance mechanism, Environment Status Report, Various instrumental techniques, EIA in detail with case studies, Environmental Economics, CETP • Knowledge on National Environmental Policy – 2006 & Provision of Constitution of India regarding Environment (Article 48A and 58A).
TYBSc (Paper-VI)	ENV-306 Environmental Biotechnology-II	• Knowledge on scope of biotechnology in environmental applications • Understand use of Bioremediation techniques • Ability to apply Biodegradation process • Understanding Role of biotechnology in environment protection • Ability to apply biotechnological techniques in treatment of water & waste water
TYBSc (Paper-VII)	ENV-307 Practical – 24	• Study detail characteristics and classification of terrestrial ecosystem. • Study remote sensing techniques with interpretation • Assessment of pollution
TYBSc (Paper-VIII)	ENV-308 Practical – 24	• Study physic-chemical parameter of water. • Monitoring of Total Suspended Particulate Matter (TSPM); monitoring of SO2, NO2, NH3, CO and O3,

		Exposure analysis of SO2, NO2 and CO, to plants leaves; Field Visit to nearby industries for studding different control technology
TYBSc (Paper-IX)	ENV-309 Practical – 12 & Project work	• Study laboratory equipment – Compound Microscope; Laminar Air Flow, Autoclave, Spectrophotometer and other basic equipment used in the laboratory • Preparation of different culture media, sterilization of media, pour plate techniques, solid media in test tubes; microbial culture, inoculation techniques, streaking, spreading and replication; microbial cell counting by serial dilution technique and pour plate technique Identification of microorganisms through biochemical tests (bacteria/fungi/virus); screening of useful microorganisms from several hosts/extreme environment (example – cellulose producing microorganism)

Course Outcomes of M.Sc (Environmental science):

Semester I

Class	Course title	Outcome
M.Sc I	EVSUT-111 Environmental Biology & Biodiversity	• Analyse the role of Ecological principles to manage ecosystems. • Demonstrate distinction between natural and managed ecosystems. • Empowers on tools and techniques used to analyse the status of ecosystems. • Develop skills to manage ecosystems for sustainable development. • Demonstrate importance of diversity at different levels of biological organization. • Lay foundation on basic concept of ecological and biological processes that ensures long-term stability of ecosystems. • Train on the methods for measurement of species diversity and molecular diversity. • Analyse the values of biodiversity and scientific approaches for conservation that can lead to sustainable development.
	EVSUT-112 Environmental Physics & Chemistry	• Develop understanding on the chemistry of the lithosphere, hydrosphere and atmosphere. • Gain understanding on the chemistry of various anthropogenic pollutants and basic analytical techniques • Trains on chemical analysis of water and waste water,

		and the scientific principle of tools and techniques used for chemical analysis. • Knowledge of analytical instrumentations • Skill developed in the field of environmental instrumentation and analyses • Basic principle and applications of physics
	EVSUT-113 Earth, Ocean and & Atmospheric Sciences	• Knowledge of structure and composition of the atmosphere and explain global atmospheric circulation • Understand the processes involved in the mixing and transport of constitutes against varied stability conditions • Recognise major chemical/ photochemical pathways of organic and inorganic gases and their implications including acid rain, smog, ozone depletion, visibility impartment • Application of knowledge in appreciating the atmosphere of large cities and global atmospheric issues • Understand the ocean physical structure and stratification • Knowledge of earth resources
	EVSUT-114 Environmental Statistics	• Knowledge of basic statistical parameters • Understanding statistical concepts required for model development. • Test model performance in terms of statistical error estimation • Understanding study univariate , bivariate and multivariate data

Course Outcomes of M.Sc (Environmental science):
Semester II

Class	Course title	Outcome
M.Sc II	EVSUT-121 Water & Soil Pollution: Management & Mitigation	• Select the sources of water for various water uses • Apply the gained knowledge to practical situations. • Demonstrate soil quality maintenance practices • Understanding soil pollution sources and how to control them • Studying different case study related to soil
	EVSUT-122 Air, Noise & Radiation Pollution: Management & Mitigation	• Able to differentiate between primary and secondary pollutants • Familiarise with different sources and sinks of common air pollutants Develop understanding about different types of monitoring • Techniques available for gaseous and particulate

		matter. Able to do sampling and analysis of air pollutant • Develop an understanding of working of air pollution control devices • Understanding noise monitoring techniques and impact criteria
	EVSUT-123 Environmental Law, Ethics & Policy	• Understand the Indian constitutional provisions with respect to the environmental protection, division of powers, and fundamental rights • Appreciation of forest and wildlife laws and environmental laws relating to social justice (Forest Dwellers' Act of 2006; The Biodiversity Act of 2002) • Comprehensive understanding of pollution control laws (The Water Act, The Air Act and the Environment (Protection) Act of 1986), and rules • Functional understanding of international Environmental laws (Treaties and Protocols), and Indian commitments • Appreciate some case studies of environmental litigation
	EVSUT-124 Water & Wastewater Technology	• Select the sources of water for various water uses. • Explain unit operations and processes of water treatment systems • Apply the principles and design water treatment units • Apply concepts and will be able to design the water treatment plant. • Explain unit operations and processes of wastewater treatment systems • Select the sources of different industries wastewater treatment process
	EVSUP-125 Environmental Sciences Practical Paper	• Physico-chemical parameter of water • Study soil quality parameter • Monitoring of Total Suspended Particulate Matter (TSPM); monitoring of SO2, NO2, NH3, CO and O3, Exposure analysis of SO2, NO2 and CO • Measurement of sounds by DB meter / SLM in silent, industrial, residential and commercial zones, Determination of SPL, Lmax, TWA, Leq, Ldn, L10, L50, L90. • Field visits and its legal interpretation – submission of detailed reports • Visit and study in detail process of water and waste water treatment plant.

Course Outcomes of M.Sc (Environmental science):

Semester III

Class	Course title	Outcome
M.Sc II	EVSC 301 Environmental Impact Analysis and Environmental Audit	• Explain the environment and its natural, and socio-economic and cultural components, and its temporal and spatial dimensions • Comprehensively understand of the origin and development of EIA and the developments in India • Appreciate the EIA process • Define impact and identify, and predict impacts • Understand the Indian EIA process and clearance regime and functional knowledge of environmental management plan (EMP), and environmental audit
	EVSC 302 Environmental Pollution II: Air, Noise and Radiation	• Able to differentiate between primary and secondary pollutants • Familiarise with different sources and sinks of common air pollutants Develop understanding about different types of monitoring • Techniques available for gaseous and particulate matter. Able to do sampling and analysis of air pollutant • Develop an understanding of working of air pollution control devices • Understanding noise monitoring techniques and impact criteria
	EVSC 303 Water and Wastewater Technology	• Select the sources of water for various water uses. • Explain unit operations and processes of water treatment systems • Apply the principles and design water treatment units • Apply concepts and will be able to design the water treatment plant. • Explain unit operations and processes of wastewater treatment systems • Select the sources of different industries wastewater treatment process
	EVSC 304 Environmental Law, Ethics and Policy	• Understand the Indian constitutional provisions with respect to the environmental protection, division of powers, and fundamental rights • Appreciation of forest and wildlife laws and environmental laws relating to social justice (Forest Dwellers' Act of 2006; The Biodiversity Act of 2002) • Comprehensive understanding of pollution control laws (The Water Act, The Air Act and the Environment

		(Protection) Act of 1986), and rules • Functional understanding of international Environmental laws (Treaties and Protocols), and Indian commitments • Appreciate some case studies of environmental litigation
	EVSC 305 Practical's III	• Preparation of EIA reports and environmental audit process • Monitoring of Total Suspended Particulate Matter (TSPM); monitoring of SO2, NO2, NH3, CO and O3, Exposure analysis of SO2, NO2 and CO • Field visits and its legal interpretation – submission of detailed reports • Visit and study in detail process of water and waste water treatment plant.
	EVSC 306 In-plant training + Seminars	• Work with various industries, consultancies and NGO's helps for the practical knowledge. Ability to communicate efficiently, management, leadership and entrepreneurship skills. Ability to identify, formulate and model problems and find solution based on environmental pollution.
	EVSC 309 Environmental Biotechnology(elective course)	• Knowledge on scope of biotechnology in environmental applications • Knowledge of microbiology and biochemistry • Ability to perform various molecular biological applications, and knowledge of equipment used in molecular biological techniques • Ability to apply molecular biological techniques in pollution management and industrial applications • Knowledge of advanced biotechnological applications, and biosafety in analytical procedures • Understanding Role of biotechnology in environment protection • Ability to apply biotechnological techniques in treatment of water & waste water • Study different types of Biosensors

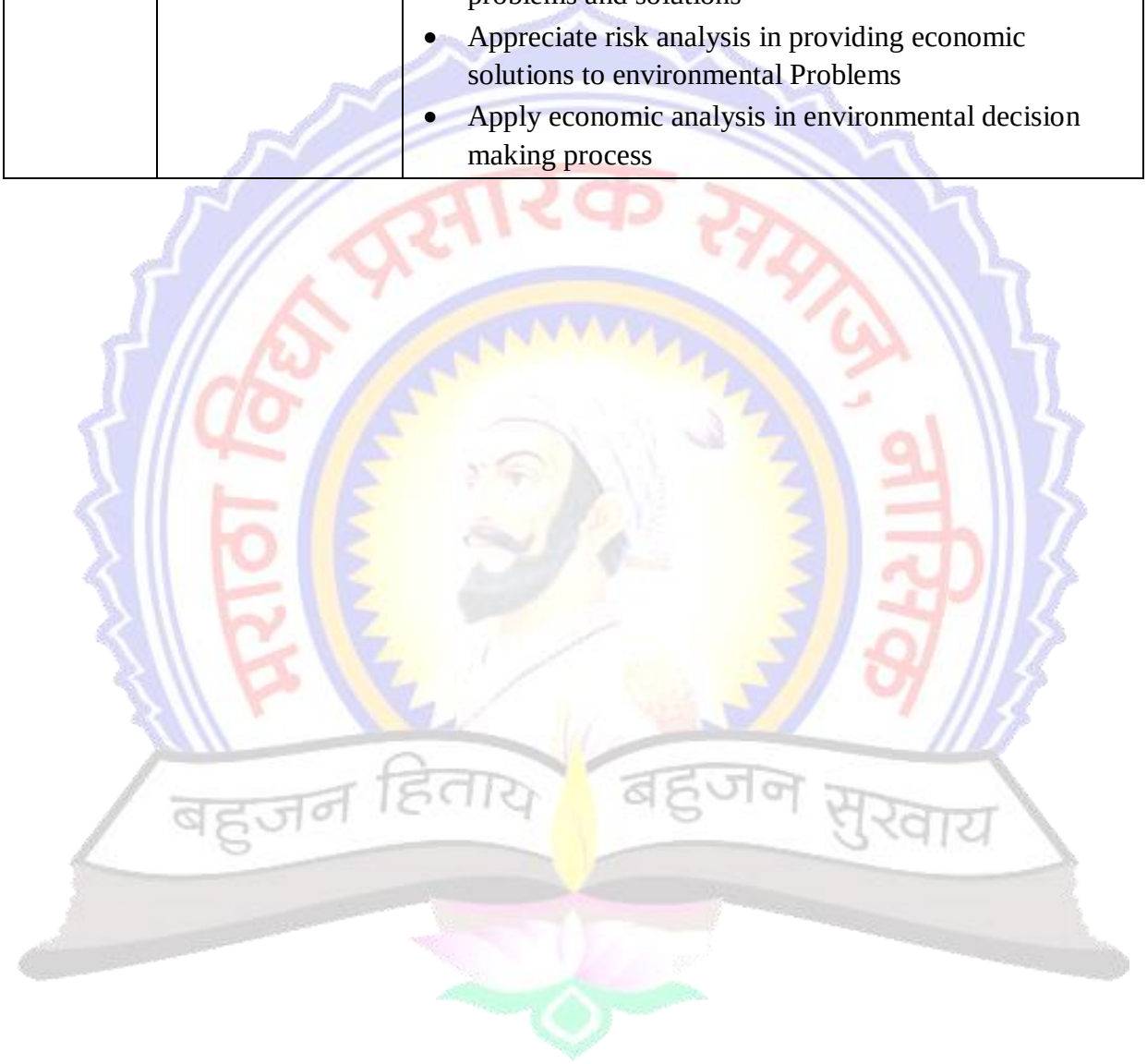
Course Outcomes of M.Sc (Environmental science):

Semester IV

Class	Course title	Outcome
M.Sc II	EVSC 401 Environmental Toxicology,	• Understanding health and safety management • Study toxic compound, hazardous material and measurement

	Health and Safety	• Evaluation methods of toxicology • Internalize ISO 18000 • Learn and disseminate issues related to occupational health and hazards. • Protocol development for an industry on disaster prevention, health issues, safety measures and environment management.
	EVSC 402 Restoration Ecology and Watershed Management	• Ability to think and function as a prudent professional soil scientist. • Generate and analyse soil quality data towards sustainable solutions. • Ability to respond flexibly towards restoration of problematic soils of specific areas • Understanding watershed management techniques structure and functions, traditional and modern methods of managements • Study successful stories of watershed managements.
	EVSC 403 Waste and Hazardous Waste Management	• Understand the characteristic of wastes and the systems, and processes of waste management. • Identify the case specific issues related to pollution potentials of solid wastes • Address solid waste management practices through a cradle-to-grave approach • Apply understanding to generate recourses from wastes • Make appropriate decisions through application of waste management principles
	EVSC 404 Renewable and Non-Renewable Energy	• Understanding of solar radiation's spectrum and the energy available from solar radiations • Should be able to make a distinction between conventional and renewable energy sources • Understanding of the principles of energy conversion in case of each of the energy sources • Should be able to state how the consumption of fossil fuels and biomass leads to adverse impact on health and climate. • Should have an understanding of the implications of large scale production of power from sources such as hydro, solar, wind etc.
	EVSC 405 Dissertation and Project Work	• The aim of the Project work is to acquire practical knowledge on the particular subject, successful completion of this course, the student should be able to work with practical knowledge/computer-based system, process, component, or program to

		meet desired. To encourage students to supplement their knowledge and to motivate them to continue their career in Research.
	EVSC 407 Environmental Economics	• Know the concepts of market and the economics of the environment • Identify economic solutions to environmental problems and the role of environmental market based instruments • Apply of economic theories to analyse environmental problems and solutions • Appreciate risk analysis in providing economic solutions to environmental Problems • Apply economic analysis in environmental decision making process



Department of Mathematics

Program outcome : B.Sc. (Mathematics)	
1.	Solve and an understanding of concepts in all disciplines of Mathematics
2.	Solve the problem and also think methodically, independently and draw a logical conclusion
3.	Be well grounded in the basic manipulative skills level of algebra, geometry, trigonometry and beginning level calculus
4.	Be able to transmit mathematics ideas both orally and in writing.
5.	Apply the underlying unifying structures of mathematics (i.e. sets, relations and functions, logical structure) and the relationships among them
6.	Gain experience investigating the real world problems and learn to how to apply mathematical ideas and models to those problems.

Program outcome : M.Sc. (Mathematics)	
1.	Inculcate critical thinking to carry out scientific investigation objectively without being biased with preconceived notions.
2.	Equip the student with skills to analyze problems, formulate an hypothesis, evaluate and validate results, and draw reasonable conclusions thereof.
3.	Imbibe effective scientific and/or technical communication in both oral and writing.
4.	Continue to acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in mathematical sciences

Program Specific outcome : B.Sc. (Mathematics)	
1.	Think in a critical manner.
2.	Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
3.	Formulate and develop mathematical arguments in a logical manner
4.	Acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the student from the given courses.
5.	Understand, formulate and use quantitative models arising in social science, business and other contexts.

Program Specific outcome : M.Sc. (Mathematics)	
1.	Understanding of the fundamental axioms in mathematics and capability of developing ideas based on them.
2.	Inculcate mathematical reasoning.
3.	Prepare and motivate students for research studies in mathematics and related fields
4.	Provide knowledge of a wide range of mathematical techniques and application of mathematical methods/tools in other scientific and engineering domains.
5.	Nurture problem solving skills, thinking, creativity through assignments, project

	work
6.	Assist students in preparing (personal guidance, books) for competitive exams e.g. NET, GATE, etc.

Course Outcomes of BSc (Mathematics):

Class	Course title	Outcome
FYBSc (Paper-I)	Algebra and Geometry	• Solve various problems on properties of integers and use the basic concepts of divisibility, congruence and their applications in basic algebra. • Apply factor theorem, remainder theorem to solve problems on polynomials and by using given relations between roots he will find the roots of polynomials • Solve the system of homogeneous and non homogeneous linear of m equations in n variables by using concept of rank of matrix, finding eigen values and eigen vectors. • Solve the problems of lines in three dimension, planes, spheres, and cylinders and how geometry is related to algebra by using their algebraic equations
FYBSc- (Paper-II)	Calculus and Differential Equations	• Identify algebraic and order properties of real numbers. • Identify and apply the function properties of real number system such as the completeness property • Verify the values of limit of a function at a point using the definition of a limit • Students will be familiar with the techniques of integration and differentiation of function with real variables • Identify and apply the intermediate value thm, Mean value thm and L"Hospital"s rule • Identify types of differential equations and solve differential equations such as Exact, homogeneous, non-homogeneous, and linear and Bernoulli differential equations etc

Semester I

SYBSc- (Paper-I)	Multivariable Calculus I	• Students learn analysis of multivariable functions, continuity, and differentiability. • learn the concepts of multiple integrals and their application to area and volumes
SYBSc (Paper-II)	Laplace Transforms and Fourier Series	• Learn the methods and properties of Laplace transform and Inverse Laplace Transform, apply them to solve Linear Differential equations. • Apply the fundamental concepts of Fourier series, Fourier Sine series, Fourier Cosine series to find series

		representation of irrational numbers.
	Discrete Mathematics	• Understand the addition and multiplication principles for counting • Understand how to apply combinatorial ideas to real life problems • Use generating functions to solve variety of combinatorial problems

Semester II

SYBSc (Paper-I)	Linear Algebra	• Use the concept of basis and dimension of vector spaces linear dependence and linear independence, to solve problems. • Use the concept of inner product spaces to find norm of vectors, distance between vectors, check the orthogonality of vectors, to find the orthogonal and orthonormal basis. • Apply the properties of linear transformations to linearity of transformations, kernel and rank of linear transformations, inverse transformations to solve the problems of matrix transformations, change of basis.
SYBSc (Paper-II)	Multivariable Calculus II	• Students develop knowledge in the limit, continuity, differentiation of vector functions. • Use the various techniques of solving Integral problems of vector valued functions.
	Numerical Analysis	• The students will not only learn how to use the finite element method, but also how to formulate and code a finite element method for any given set of partial differential equations. Thus, the finite element method is developed as a tool for the numerical solution of partial differential equations, and not confined only to structural mechanics applications the way it is typically taught. • The students will learn how to Solve the Ordinary differential equation by various methods • The students will learn how to find the Integration & Derivative by various methods • The students will learn how to find the roots of the equation by various methods

Semester I

TYBSc (Paper-I)	Metric Spaces	• Learn the basic abstract ideas of analysis • Learn the basic ideas open sets, closed sets, limit point, isolated points, boundary points, subspace, product metric spaces and apply them to study the narure of sets.

		• Leran the theorems on completeness, compactness, connectedness and use them to solve the problems. identify the continuity of a function which is defined on metric spaces, at a given point and identify the set of points on which a function is continuous by using different theorems.
TYBSc (Paper-II)	Real Analysis-I	• Know sequence and series of real numbers and their convergence and divergence.
TYBSc (Paper-III)	Group Theory	• Identify the various algebraic structures with their corresponding binary operations. • Generalize the groups on the basis of their orders, elements, order of elements and group relations • Compare two groups of same orders on the basis of isomorphism Criteria. • Compute the possible subgroups of given group of specific orders and will recognize them.
TYBSc (Paper-IV)	Ordinary Differential Equations	• Solve linear differential equations with constant coeffiecients, non-homogeneous differential equations, system of first order equations, solution of differential equations by Power series method
TYBSc (Paper-V)	Operations Research	• Formulate and model a LPP from a word problem and solve them graphically in 2-D. • Modify a primal problem and use the LPP to identify the new solution • Understand basic notions like feasibility, infeasibility, basic solutions, unbounded solutions etc.
TYBSc (Paper-VI)	Number Theory	• Solve various problems on properties of integers and use the basic concepts of divisibility and their applications in basic algebra. • Apply Euclid‟s algorithm and backwards substitution. • Understand the definitions of congruence’s, residue classes and least residues

Semester II

TYBSc (Paper-I)	Complex Analysis	• Solve problems on basic concepts of modulus, argument of a complex number, de Moiver’s theorem and use them to find roots of an algebraic equation. • Define continuity and differentiability for complex functions • Prove the Cauchy-Riemann equations and apply them to complex functions in order to determine whether a given continuous function is complex differentiable • Evaluate integrals along a path - directly from the

		definition and also via the Fundamental Theorem of Contour Integration and Cauchy's Theorem, • Compute the Taylor and Laurent expansions of simple functions, determining the nature of the singularities and calculating residues • Prove the Cauchy Residue Theorem and use it to evaluate integrals
TYBSc (Paper-II)	Real Analysis-II	• Know convergence of sequence and series of functions, Riemann integrals, Improper integrals and its applications,
TYBSc (Paper-III)	Ring Theory	• Assess properties implied by the definitions of rings • Use various canonical types of rings • Analyze and demonstrate examples of ideals and quotient rings • Use the concept of isomorphism and homomorphism for rings
TYBSc (Paper-IV)	Partial Differential Equations	• Form the partial differential equations and Solve the problems on Pfaffian differential equations. Solve the problems on first order and higher degree partial differential equations and its applications.
TYBSc (Paper-V)	Optimization Techniques	• Solve the project management related problems by using the concepts of CPM, PERT so as to findout the project completion time • Fond the optimal solutions of Game theory problems, Optimal solution of two person zero sum game, Solution of mixed strategy games, graphical solution of games, linear programming solution of game. • Solve the problems on Replacement policy after failure, how to process the n jobs on two machines or three machines in minimum time so that the machines remain idle for short time. • Solve the optimization unconstrained the optimization problems and constrained optimization problems of multivariable functions.
TYBSc (Paper-VI)	Computational Geometry	• Design, analyze and develop algorithm and method for solving geometric problems efficiently • Assess theoretical and practical problems that involves geometry • Generalize basic notions of reflection, rotation, projection with real life examples

Course Outcomes of M.Sc (Mathematics):

Semester I

Class	Course title	Outcome
M.Sc.I	Complex Analysis	• Analyze sequence and series of analytic functions and types of convergence • Represent complex numbers pictorially and geometrically • Apply concept and consequences of analyticity and C-R-equations • Compute complex contour integrals and applying the Cauchy‟s integral in various versions. • Understand geometric interpretations of complex numbers
	General Topology	• Understand various basic topologies • Understand the core ideas of countability and uncountability • Understatnd the theory of compactness, connectedness and completeness • Understand the heridatory topological properties • Understand the thms on normal spaces, regular spaces and relation between them
	Linear Algebra	• Use the concept of basis and dimension of vector spaces linear dependence and linear independence to solve problems. • Apply the properties of linear transformations to linearity of transformations, kernel and rank of linear transformations, inverse transformations to solve the problems of matrix transformations, change of basis. • Solving linear equations, working with matrices, in particular eigenvalues and eigenvectors, and applying the techniques to real life problems like graph theory, computer science, Electronics and applied Mathematics
	Ring Theory	• Analyze and demonstrate examples of ideals and quotient rings • Use the concept of isomorphism and homomorphism for rings • Assess properties implied by the definitions of rings and modules • Confidently apply algebraic concept
	Partial Differential Equations	• Solve examples on Charpit‟s and Jacobi‟s method • Solve wave equations, heat equations, boundary value problems, Lapalce equations, Cauchy problem, Dirichlet and Neumann problem for different regions. • Classify the various second order partial differential equations.

Course Outcomes of M.Sc (Mathematics):

Semester III

Class	Course title	Outcome
M.Sc.II	Combinatorics	• Understand the ideas of permutations and combinations • Understand the addition and multiplication principles for counting • Understand how to apply combinatorial ideas to real life problems • Use generating functions to solve variety of combinatorial problems
	Field Theory	• Understand basic notions in the theory of field extensions • Apply the thms of algebraic extensions, splitting fields, separable and insepa. Extensions to find the various examples of extensions. • Relate the group theory and Galois theory in finding the Galois extension and Galois group. • Understand basic theory of composite extensions, simple extensions and cyclotomic extensions
	Functional Analysis	• Student learns the basics of functional analysis. • They learn to treat the vector spaces which have the additional property of being topological spaces. • Blending of these two structures brings them an exposure to higher mathematics. Important theorems like the Hahn-Banach theorem are taught here. These theorems stand a student in good stead throughout his mathematical life. • The student having seen basic analysis and linear algebra is expected to learn how these topics play a significant role, first in multi-variate calculus which then naturally leads to calculus on manifolds. • The intimate relationship between analysis and geometry should become apparent at the end of this course.
	Topics in Analysis -I	• Explain the Fundamental concepts of the Theory of Integral Equation. • Distinguish the difference between Differential Equations and Integral Equations,singular integral equation. Convert he differential equation into an integral equation and vice versa. • Solve the problems on Fredholm integral equations by Adomian decomposition memthod, direct computation method and on Volterra integral equations equations by Adomian decomposition methodseries solution method successive approximation method. • Find the solution of the problems on Fredholm Integro differential equation, Volterra Integro differential

		equation. • Learn the methods and properties of Laplace transform and Inverse Laplace Transform, apply them to solve Linear Differential equations. • Apply the fundamental concepts of Fourier transform, Fourier Sine Transform, Fourier Cosine Transform to Evaluate Improper Integrals.
	Topics in Algebra	• Understand various basic topologies • Understand the core ideas of countability and uncountability • Understatnd the theory of compactness, connectedness and completeness • Understand the heridatory topological properties • Understand the thms on normal spaces, regular spaces and relation between them

Course Outcomes of M.Sc (Mathematics):
Semester IV

Class	Course title	Outcome
M.Sc.II	Number Theory	• Solve various problems on properties of integers and use the basic concepts of divisibility, congruence and their applications in basic algebra. • The students are able to Free Open Learn course, Introduction to number theory, as well as becoming proficient at modular arithmetic, you should find that you are increasingly able to communicate mathematical ideas and apply your knowledge and understanding to mathematics in everyday life, in particular to applications, such as the prevention of errors in ID numbers
	Differential Geometry	• Recognize different types of graphs and its level sets • Understand basic notions related vector fields, tangent spaces and surfaces • Understand core ideas of orientation, geodesics, parallel transport, Weingarten map and Curvatures • Solve examples on curvatures, arc lengths and line integrals, curvature of surfaces
	Fourier Analysis and Boundary Value Problems	• Find the Fourier series representation of a function of one variable • Find the solution of Wave equation, Lapalce equation. Heat equation using the fourier series
	Discrete Mathematics	• Understand the language of graphs and model • Understand the use of graphs as model

		• Solve real world problems using graphs and trees
	Topics in Algebra	• Analyze and demonstrate examples of ideals and quotient rings • Use the concept of isomorphism and homomorphism for rings • Assess properties implied by the definitions of rings and modules • Confidently apply algebraic concept

Department of MICROBIOLOGY

Program outcome : B.Sc. (Microbiology)	
1.	A candidate who is conferred an UG (Hons) degree i.e. B.Sc. (Hons) degree in microbiology needs to have acquired/developed following competencies during the programme of the study:
2.	PO -1 Acquired knowledge and understanding of the microbiology concepts as applicable to diverse areas such as medical, industrial, environment, genetics, agriculture, food and others.
3.	PO -2 Demonstrate key practical skills/competencies in working with microbes for study and use in the laboratory as well as outside, including the use of good microbiological practices.
4.	PO -3 Competent enough to use microbiology knowledge and skills to analyze problems involving microbes, articulate these with peers/ team members/ other stake holders, and undertake remedial measures/ studies etc.
5.	PO -4 Developed a broader perspective of the discipline of Microbiology to enable him to identify challenging societal problems and plan his professional career to develop innovative solutions for such problems.

Program outcome : M.Sc. (Microbiology)	
1.	The objective of the Master's Programme in Microbiology is to equip the students with updated knowledge of prokaryotic and eukaryotic cellular processes, microbial taxonomy, biostatistics, molecular biophysics, molecular biology and biochemistry.
2.	PO -1 To enrich students' knowledge and train them in the pure microbial sciences
3.	PO -2 To introduce the concepts of application and research in Microbiology
4.	PO -3 To inculcate sense of scientific responsibilities and social and environment awareness
5.	PO -4 To help students build-up a progressive and successful career
6.	PO -5 To introduce the concepts of mathematics in biology

Program Specific outcome B.Sc. (Microbiology)	
6.	PSO1- For the subject of Microbiology the outcomes are defined in terms of the understanding and knowledge of the students in microbiology and the practical skills the students are required to have to be competitive microbiologist so that they are able to play their role as microbiologist wherever required in the society

	such as the diseases caused by the microbes, their diagnosis and remedies; the role of microbiologists in the biotechnology industry and how they may be able to fit the bill in the industry.
1.	PSO2 - The students are also trained in such a way that they develop critical thinking and problem solving as related to the microbiology.
2.	PSO3 - The curriculum envisions that the student, once graduate as specialists in a discipline, have an important role to play in the newer developments and innovations in the future in the subject for advancement of the discipline.
3.	PSO4- The students graduating in this degree must have through understanding of basic knowledge or understanding of the fundamentals of Microbiology as applicable to wide ranging contexts.
4.	PSO4- They should have the appropriate skills of Microbiology so as to perform their duties as microbiologists.
5.	PSO5- The students graduating in microbiology should also develop excellent communication skills both in the written as well as spoken language which are must for them to pursue higher studies from some of the best and internationally acclaimed universities and research institutions spread across the globe.

Program Specific outcome : M.Sc. (Microbiology)	
1.	PSO1- students should be well acquainted with research methodology which includes different skill developments in scientific writing, data handling and processing, development of research ideas and planning / designing of research projects. The skill sets thus evolved will help the students in academic and applied research
2.	PSO2- They must be able to analyze the problems related to microbiology and come up with most suitable solutions.
3.	PSO3-As microbiology is an interdisciplinary subject the students might have to take inputs from other areas of expertise. So the students must develop the spirit of team work.
4.	PSO4- Microbiology is a very dynamic subject and practitioners might have to face several newer problems. To this end, the microbiologists must be trained to be innovative to solve such newer problems.
5.	PSO5- The students are trained to pick up leads and see the possibility of converting these into products through entrepreneurship. To this end, the students are made to interact with industry experts so that they may able to see the possibility of their transition into entrepreneurs.
6.	PSO6- They are also made aware of the requirements of developing a Microbiology enterprise by having knowledge of patents, copyrights and various regulatory process to make their efforts a success
7.	PSO7 - Besides attaining the attributes related to the profession of Microbiology, the post graduates in this discipline should also develop ethical awareness which is mandatory for practicing a scientific discipline including ethics of working in a laboratory work and ethics followed for scientific publishing of their research work

	in future.
8.	PSO8- The students graduating in microbiology should also develop excellent communication skills both in the written as well as spoken language which are must for them to pursue higher studies from some of the best and internationally acclaimed universities and research institutions spread across the globe.

Course Outcomes of B.Sc. (Microbiology):

Semester I

Class	Course title	Outcome
FYBSc (Paper-I)	MB 111 - Introduction to Microbial World	• Development of microbiology as a discipline • Golden Era of Microbiology • Modern Era of Microbiology • Nobel laureates in Life Sciences of 21st Century • Types of Microorganism and their differentiating characters • CO-6. Beneficial and Harmful effects of microorganisms
FYBSc- (Paper-II)	MB 112 - Basic Techniques in Microbiology	• Introduction to Modern SI units • Principles and Working of different types of Microscopes • Staining Techniques • Sterilization and Disinfection • Checking of efficacy of chemical disinfectant
FYBSc- (Paper-III)	MB 113 - Practical Course based on theory paper I and II	• CO -1 Safety measures and Good Laboratory Practices in microbiology laboratory • Introduction, operation, precautions and use of common microbiology laboratory instruments • Checking of efficacy of chemical disinfectant working and care of bright field microscope. • Observation of Microorganisms • Introduction and use of common laboratory glass wares • CO-6 Basic staining techniques • CO-7 Observation of motility in bacteria • CO-8 Checking of efficacy of chemical disinfectant

Semester II

Class	Course title	Outcome
		Students should become conversant with the topics mentioned below

FYBSc (Paper-I)	MB121 - Bacterial Cell and Biochemistry	• Bacterial Cytology : Structure, chemical composition and functions of the components in bacterial cell • Chemical Basis of Microbiology • Chemistry of Biomolecules: Structure, organization and functions Carbohydrates: Definition, classification • Classification of Bacteria and Viruses
FYBSc- (Paper-II)	MB122 - Microbial cultivation and growth	• Cultivation of Microorganisms : nutritional classification, Design and preparation of media, Isolation and Enumeration and maintenance of bacteria, Role of Culture collection centres and National Biodiversity Authority for culture collection centres • Bacterial growth : Kinetics, Growth curve and Generation time, Methods of enumeration of bacterial growth
FYBSc- (Paper-III)	MB123- Practical Course based on theory paper I and II	• Preparation of simple laboratory nutrient media • Checking sterilization efficiency of autoclave • Preparation of Winogradsky's column • Special staining techniques • Isolation and Enumeration of bacteria • Study of normal flora of skin • effect of different parameters on growth of E. coli • Preservation of cultures

Semester I

Class	Course title	Outcome
		Students should become conversant with the topics mentioned below :
SYBSc- (Paper-I)	MB – 211: Bacterial Systematics & Physiology	• Bacterial Systematics : Chemotaxonomy, Numerical taxonomy, Genetic basis of taxonomy • Bacterial Physiology: Radioisotopes, Metabolic pathways, High Energy Compounds, Electron transport chain, phosphorylation • Biocatalysts: Enzymes, Nomenclature & classification and structure of active site, enzyme catalyzed reactions,effect of different parameters on enzyme activity,activators and inhibitors.

SYBSc (Paper-II)	MB – 212: Industrial And Soil Microbiology	• Introduction To Industrial Microbiology: • Characteristics of industrially important microorganisms, Screening and inoculums development, Design of a fermenter, Monitoring of different fermentation parameters, Types of fermentations,Media for industrial fermentations. • Soil Microbiology:Types Of Soil and Soil Microorganisms, Microbial Interactions, Rhizosphere Microflora ,Composting And Humus Formation, Biofertilizers , Biocontrol Agents • Elemental Cycles In Nature, Degradation Of Cellulose, Hemicelluloses, Lignin And Pectin

Semester II

Class	Course title	Outcome
		Students should become conversant with the topics mentioned below :
SYBSc (Paper-I)	Mb – 221: Bacterial Genetics	• Understanding Molecules Of Heredity: • RNA world and shift to DNA world with time, Discovery of transforming material ,nucleic acid as genetic material, Prokaryotic genome organization • Concept of Gene, different forms of DNA. • DNA Replication And Expression • Mutations And Reversions • Plasmid Genetics
SYBSc (Paper-II)	MB – 222: Air And Water Microbiology	• Air Microbiology • Water Microbiology • Sewage and Waste Water Microbiology
SYBSc (Paper-III)	MB – 223: Practical Course Based On MB 211, 212, 22 1, 222	• Calculation of air flora by air sampling • Micrometry • Calculation of growth rate, specific growth rate and generation time • Bacteriological tests of potability of water • Determination of B.O.D., total solids and total suspended solids of Waste waters • Biochemical characterization and identification of bacteria • CO-6 Diversity determination of Air Flora: • CO-7 Induction of mutations and isolation of mutants by any suitable method

Semester I

Class	Course title	Outcome

		Students should become conversant with the topics mentioned below :
TYBSc (Paper-I)	Mb – 331: Medical Microbiology - I	• Introduction to infectious diseases related to :Respiratory system, Gastrointestinal system, Kidney and Liver, Genital system, Central nervous system • Epidemiology: Mortality and morbidity rates, Disease distribution, Case control and cohort studies, Clinical trials, Epidemiology of infectious diseases. • Study of bacterial pathogens: Enteric pathogens, Pyogenic organisms, Spirochetes Clostridium, Bacillus anthracis, Mycobacterium, Rickettsia, Pneumococci and Neiserria
TYBSc (Paper-II)	Mb – 332: Genetics And Molecular Biology	• Gene Linkage and crossing over: Mendelian laws • Recombination in eukaryotes, Gene linkage and cross over, Chromosome mapping Tetrad analysis and parasexual cycle. • DNA Replication: Single replicon, Priming reaction, DNA polymerases, Termination, Mismatched repair • Prokaryotic and Eukaryotic Transcription • Prokaryotic and Eukaryotic Translation • Guidelines for gene manipulation: recombinant DNA technology and its guidelines for recombinant DNA technology laboratory set up • CO-6 Techniques used in recombinant DNA technology
TYBSc (Paper-III)	MB – 333: ENZYMOLOGY	• Enzymes: Structure of enzymes, Role of cofactors in metabolism. • Enzyme assays: Principles of enzyme assays, Enzymes assays by Spectro photometric methods, Spectro flurometric methods, Radioisotope assay • Principles and Methods of Enzyme purification: cell fractionation, Principles and methods of enzyme purification, Criteria for purity and Characterization of enzymes. • Enzyme Kinetics : Concept and use of initial velocity, Michaelis Menton equation, plots for plotting Kinetic data, Enzyme Inhibitions • Metabolic Regulations : Allosteric enzymes, regulatory enzymes, Isozymes, Multienzyme complex • CO-6 Immobilization of enzymes and whole cells: methods of immobilization and applications

TYBSc (Paper-IV)	MB – 334: Immunology – I	• Classification of Immunity • Formation of blood cells • Organs of immune system • Innate immunity • Antigens • CO-6 Immunoglobulins • CO- 7 Adaptive / Acquired Immunity: Humoral and cell mediated immune response • CO-8 Transplantation and Immunity
TYBSc (Paper-V)	MB – 335: Fermentation Technology – I	• Strain Improvement • Media optimization: • Sterilization of Media: • Scale-up and Scale-down: • Principles and methods of downstream processing: • CO-6 Quality assurance (QA) of fermentation product • CO-7 Fermentation economics • CO-8 Introduction to Intellectual Property Rights (IPR)
TYBSc (Paper-VI)	MB – 336: Food And Dairy Microbiology	• CO -1 Dairy Microbiology: Dairy Development in India, Milk Chemistry and Constituents, Microbiology of milk, Preservation of Milk by Pasteurization & its storage, Microbial analysis of milk • Food Microbiology: Classification of Foods based on stability, Food spoilage and preservation, Microbial food poisoning and food infection, Fermented foods, Applications of genetically modified microorganisms and Food Sanitation and regulation

Semester II

Class	Course title	Outcome
		Students should become conversant with the topics mentioned below :

TYBSc (Paper-I)	Mb – 341: Medical Microbiology - II	• Chemotherapy, Parameters Of Good Chemotherapeutic Agent ,Routes Of Drug Administration • Mode Of Action Of Antimicrobiol Agents On • Bacteria,Fungi,Viruses,Protozoa,Resistance To Antibiotics. • Introduction To Cultivation Of Viruses: Study Of Following Groups Of Viral Pathogens HIV, Polio Virus, Hemorrhagic Viruses (Dengue, Ebola),Hepatitis A And Hepatitis B Viruses,Influenza Virus (Human, Swine And Bird)FMD Virus And Rinderpest Virus,Japanese Encephalitis Virus,Rota Virus,Rhabdoviruses (Rabies), Herpes Virus (Simplex, Zoster),Oncogenic Viruses (DNA, RNA) • Study Of Following Groups Of Parasites: Plasmodium,Entamoeba, Giardia • Study Of Following Groups Of Candida And Non-Candida Fungal Pathogens
TYBSc (Paper-II)	Mb – 342 : Genetics And Molecular Biology	• Gene transfer, Recombination and Mapping Techniques: • DNA damage and repair • Recombination and Mutants in Bacteriophages • Tools of Recombinant DNA technology • Generation of recombinant DNA molecule
TYBSc (Paper-III)	MB – 343: METABOLISM	• Membrane transport mechanisms • Bioenergetics • Biosynthesis and Degradation • Bacterial Photosynthesis
TYBSc (Paper-IV)	MB – 344: Immunology – II	• Major Histocompatibility Complex • CO -2 Cytokines • Antigen- Antibody Interactions • CO 4 Immunohematology • CO- 5 Public health immunology Types of vaccines and antisera • CO-6 Hypersensitivity • CO-7 Monoclonal Antibodies : Preparation and Production
TYBSc (Paper-V)	MB – 345: Fermentation Technology – II	• Introduction to Solid State Fermentation and Submerged Fermentation • Large scale production of: Vitamins, Amino acids, Organic acids, Ethanol and alcoholic Beverages, Antibiotics, Enzymes, Microbial transformation of steroids, Biomass based products, Milk products, Vaccines and Immune sera

TYBSc (Paper-VI)	MB – 346**:** Agricultural And Environmental Microbiology	• Agriculture Technology: Plant growth improvement, disease control, Biochemistry and production of bio-fertilizers, Bioremediation, Bioaugmentation, Biosorption, Bioleaching • Nanobiotechnology: Synthesis of Nanoparticles using microorganisms and its' applications • Microbial Biosensors and Biochips in Environmental Monitoring • Biofuel cells and Biodegradable plastic: • Bioterrorism
TYBSc (Paper-VII)	MB – 347**:** Practical Course I Applied Microbiology	• Screening and isolation of pesticide degrading microorganisms • Isolation and identification of lactic • Laboratory scale fermentation, estimation, product recovery and yield • calculation of ethanol • Antibiotic and growth factor assay (agar gel diffusion technique) • Sterility testing of non-biocidal injectables • CO-6 MIC and MBC of Antibacterial compounds • CO-7 Tests for Milk and Dairy products • CO-8 Enrichment, Isolation, Preparation and Application of Bioinoculants • CO-9 Isolation and identification of Xanthomonas, Aspergillus • 0 Antifungal activity of Lactic acid bacteria. • 1 Microscopic examination of Fungi causing Rust and Smut infections in Plants • 2 Dye removal from wastes by dead microbial Biomass

TYBSc (Paper-VIII)	MB – 348: Practical Course – II Biochemistry And Molecular Biology	• Determination of absorption spectra and molar extinction co-efficient • Estimations of: blood sugar, blood urea, serum cholesterol, serum proteins and albumin • Qualitative analytical tests for proteins and carbohydrates • Preparation of buffers • Paper chromatography • CO-6 Estimation of total carbohydrates, reducing sugar and proteins • CO-7 Screening of amylase producing organisms, Production, Precipitation and determination of specific activity of crude and purified amylase • CO-8 Isolation and enumeration of bacteriophages • CO-9 Genomic (bacterial) DNA isolation and detection • 0 Isolation of plasmid DNA and gel electrophoresis • 1 Transformation of E. coli and selection of recombinants
TYBSc (Paper-IX)	MB – 349: Practical Course –III Diagnostic Microbiology And Immunology	• Clinical microbiology: Physical, Chemical and Microscopic examination of Clinical samples, Isolation, identification of pathogens from clinical samples • Epidemiological survey • Hemogram • Immunohematology • Agglutination tests • CO-6 Immunoprecipitation • CO-7Serum protein separation by electrophoresis • CO-8 ELISA (Antigen/ Antibody detection) • CO-9 Egg inoculation

Course Outcomes of M.Sc-I (Microbiology):

Semester I

Class	Course title	Outcome

M.Sc-I	**MB501- Microbial Systematics**	• Bacterial Systematics, Phenetic • Phylogenetic & Polyphasic Approach • Microbial Diversity, Species divergence and measurement of microbial diversity,Measures and indices of diversity • Exploration of Un-culturable microbial diversity, Culture independent molecular methods for identifying unculturable bacteria. • Evolution, evolutionary theory(Lamarckism, Darwinism), Neo Darwinism, r and k selection
	MB502- Quantitative Biology	• Descriptive Statistics, Measures of central tendency – Mean Mode, median, Data presentation, • Inferential Statistics, Uncertainty: Variation, Probability and inference, The concepts of null hypothesis, Test statistics, Parametric statistical test: Z-test, t-test and F-test • Inferential Statistics-2, Chi square test, ANOVA One way and two way, Nonparametric Tests • Probability and Probability Distribution, Laws of probability (addition and multiplication);Probability distribution – Normal ,Binomial and Poisson distributions.
	MB503- Biochemistry and Metabolism	• Protein Chemistry, classification of amino acids, Structural classification of proteins, Ramchandran plot • Biochemistry and Molecular Biology Techniques, Chromatography, Electrophoresis, Polymerase chain reaction, Sequencing methods • Developmental Biology, Conserved nature of development, Hox code, MPF, Morphogenesis and organogenesis in plants • Cell biology, Endoplasmic Reticulum, Golgi apparatus, Nucleus, Mitochondrion, chloroplast, Cytoskeleton.
Choice Based Optional Papers Elective/ Departmental Course	**MBTE13- Microbial communication, Membrane transport and signal transduction**	• Communication and Coordination among microorganisms, Life cycle of Dictyostelium discoideum, Quorum sensing • Membrane transport and signal transduction, Solute transport across membranes, Signal transduction pathways in bacteria, chemotaxis

	MBPE13- Practicals Based on Microbial communication , Membrane transport and signal transduction	• Communication And Coordination among microorganisms, estimation of biofilm, Bioassay for determination of quorum sensing signals, • Membrane transport and signal transduction, , Different methods of cell disruption
Core Compulsory Practical paper	**MBCP1 Biochemical Techniques (Practical based on compulsory theory credits)**	• Safety rules in Laboratory • Preparation of buffers • Computer applications • Study principles of osmosis and diffusion using artificial membranes • Isolation and identification of Alkaliphiles and Thermophiles • CO-6-Extraction of Protein and Exo-polysaccharide • CO-7-Chromatography • CO-8-Electrophoresis

Course Outcomes of M.Sc-I (Microbiology):
Semester II

Class	Course title	Outcome
M.Sc-I		Students should become conversant with the topics mentioned below :
Core Compulsory Theory Papers	**MB601, Instrumentation and Molecular Biophysics**	• Separation and analysis of biomolecules, Chromatography, Electrophoresis • Spectroscopy, UV/Visible, Fluorescence, Infrared, Mass spectroscopy • Biophysical Techniques, NMR spectroscopy, X-ray crystallography, • Radioisotopes in Biology and Confocal Microscopy, Radiation and Radioactive isotopes, confocal principle, resolution and point spread function

	MB602, Molecular Biology	• RNA processing &Molecular Techniques • RNA Processing: Eukaryotic, Chromatin Immuno-precipitation (ChIP),Designing probe, Epitope tagging • Tools for Genetic engineering, Restriction endonucleases and methylases, Vectors for cloning and gene expression, Construction of cDNA and genomic libraries • Genome projects, Gene annotation • Human Genome project and its applications, • Moleculardiagnostics and applications, Detection of miRNA signatures of Cancer, Protein arrays to detect polygenic diseases
	MB603, Enzymology, Bioenergetics and Metabolism	• Enzymology, Kinetics of reversible inhibitions, Concept of allosterism, positive and negative co-operativity • Bioenergetics, Laws of thermodynamics, entropy, enthalpy, free energy, High energy compounds, Atkinson's energy charge • Lipid Chemistry and Metabolism, Structure and function of: triglycerides, phospholipids, sphingolipids, terpenes, prostaglandins, waxes, and steroids. Degradation of fatty acids, Lipids as signal molecules • Carbohydrate Chemistry and Metabolism • Isomerism in sugars, Sugar derivatives, Regulation of Glycogen synthesis, TCA cycle- regulation
Choice Based Optional Papers Elective/ Departmental Course	**MBTE23, Nitrogen Metabolism, respiration and Photosynthesis**	• Nitrogen Metabolism, Biosynthesis of five families of amino acids and histidine,Biosynthesis of purine and pyrimidine bases • Respiration, . Anaerobic Respiration, oxidized sulfur compounds, and nitrate as electron acceptor, Biochemistry of methanogenes • Photosynthesis, Organization of photosystem I and II, cyclic and non-cyclic flow of electrons, Z scheme, Hill reaction, photolysis of water,C3, C4 CAM plants, Photorespiration, Regulation of photosynthesis
	MBPE23, Practicals based on Nitrogen Metabolism, respiration and Photosynthesis	• Isolation, production and Detection of Indole acetic acid, Siderophore, • Enrichment ,Isolation and characterisation of nitrogen fixing activity of bacteria, lignin/xylan degraders from Soil • Extraction and estimation of a) polyphenols, b) tannins, • Enrichment, Isolation and characterisation of Sulphur reducing bacteria/Methanogens, Cyanobacteria

Core Compulsory Practical paper	**MBCP2, Molecular biology, enzymology and instrumentation Techniques(Practical based on compulsory theory credits)**	• Concept of lac-operon: Lactose induction of Beta galactosidase; Glucose Repression; Diauxic growth curve of E. coli. • Plasmid DNA isolation, DNA quantitation, Curing of bacterial Plasmid • Construction of restriction digestion map of plasmid DNA • Purification of enzymes (Amylase/Invertase), Determination of Km, Vmax and Kcat values of enzyme • Determination of molecular extinction coefficient of biomolecule • CO-6- Extraction and Detection of Aflatoxin in food • CO-7- Scientific Communication and Research Methodology, , scientificwriting skills, Significance of communicating science, ethical issues, copyrights and plagiarism

Course Outcomes of M.Sc II (Microbiology):
Semester III

Class	Course title	Outcome
M.Sc-II	**MB – 701: Immunology**	• Students should become conversant with the topics mentioned below : • Cell surface molecules and receptors, Structure and function of G-protein coupled • receptors, Toll-like receptors, Tyrosine kinase linked receptors • Regulation of Immune response, Negative regulation - Immunological tolerance, Regulation of immune responses by: antigen, antigen-antibody complexes, Immunomodulation: BRMs for therapy • Experimental Immunology, Animal Cell Culture techniques, In vitro systems –Quantification of cytokines (ELISPOT assay), In vivo systems- Inbred animal strains, Knock- out mice, transgenic animals • Infection and Immunity, Host immune response to pathogens, , pathophysiology and Immunotherapeutic approaches, Bacterial, Viral, Parasitic infections • Immunological disorders, Pathophysiology, diagnosis, prognosis and therapeutic approaches, Immunodeficiency disorders, Autoimmune disorders
	MB – 702: Molecular Biology – I	• Tools in molecular biology, Activity gel assay, ChIP,, Designing probe, Detection of DNA binding, DMS foot printing, Protein foot printing, Knockout mice, RFLP, finding the replicon, DNA finger printing • Fine Control of Prokaryotic and Eukaryotic transcription, Lactose operon, The Arabinose operon, The trp operon, Sigma factor Switching • RNA processing, mRNA processing: splicing, capping, polyadenylation, rRNA processing: tRNA processing, Non coding RNAs • Mobile DNA elements, Transposable elements in bacteria, IS elements, Replicative, nonreplicative transposons, and Mu transposition, Tn A, Tn 5 and Tn 10 transposition, SINES, LINES and Alu elements • Techniques in Molecular biology and diagnostic applications, , nested PCR, Hot start PCR, RT –PCR and Real time PCR (Q –PCR), DNA microarray

	MB- 703: Industrial wastewater treatment	• Principles of Wastewater Treatment, The need for Wastewater Treatment, Methods for estimating parameters used for determining treatment efficacy • Pretreatment & Primary treatment process (Unit Processes), Flow equalization, Screening, Flocculation, Flotation • Secondary and Tertiary Treatment process (Unit Processes) ,Biological Processes (Aerobic), Biological Processes (Anaerobic), Biological processes (Combined • Current industrial wastewater treatment processes, Dairies, Food processing • Dyeing industry / Dye-house effluents, Paper manufacture • Advanced, Combined and Innovative wastewater treatment processes, Submerged Aerobic Fixed Film reactors (SAFF),Membrane bioreactors (MBRs)
	MB-711: Practical course based on Immunology, Pharmaceutical Microbiology and Environmental Microbiology	• Antigen . Antibody Interactions • Precipitation reactions of antigen-antibody • Cell Culture Techniques • Chick embryo fibroblast cell culture • Detection and isolation of anti-infectives from plant, Extraction of bioactive principles from plant and activity fractionation • Industrial waste water treatment, Estimation of pollution load of a natural sample • On-site experimentation, Visit to institute / Industry for demonstration of ELISPOT / CFT / FACS / animal inoculation and bleeding
	MB-712: Practical course based on Molecular Biology (I and II) and Microbial Technology	• Molecular Biology – I, Plasmid DNA isolation and Characterization,Transformation • Molecular Biology – II, Molecular Characterization of bacterial isolates, Gene annotation • Bioconversion, Bioconversions using immobilized systems (cells / enzyme) • Laboratory scale production • Laboratory scale production and media optimization for exopolysaccharide / bioemulsifier production • Biosorption, Biosorption of dyes or metals using dead biomass.

Course Outcomes of M.Sc II (Microbiology)

Semester IV

Class	Course title	Outcome
MSc II	MB – 801: Pharmaceutical and Medical Microbiology	• Drug Discovery and Development: • Development of Anti-infectives: Susceptibility Testing: • Determinants of Microbial Pathogenicity:, Toxigenesis, Bacterial resistance to host defenses, Molecular basis of bacterial pathogenicity • Discovery of anti-infectives: Drug targets in bacteria with examples of established drugs, Methods to study mode of action of anti-infectives, Laboratory methods to assess activity of antimicrobial combinations • Quality Assurance and Validation in Pharmaceutical Industry: Good Manufacturing Practices (GMP) and Good • Laboratory Practices (GLP) in pharmaceutical industry. Quality assurance and quality management in pharmaceuticals ISO, WHO and US certification, Safety profile of drugs
	MB 802: Molecular Biology	• Genomics • Gene technology • Genetically modified plants and animals • Bioremediation and biomass utilization • Genome projects
	MB 803: Microbial Technology	• Bioreactor design and operation • Process Variables and Monitoring • Microbial Processes and Intellectual property rights: Intellectual Property Rights (IPR): Upstream, Fermentation and Downstream Processing • Microbial Growth characteristics and product formation: Kinetics of growth and product formation • Principles of Validation Process / Method Validation: The concept of ISO Certification.Preparation of SOPs
	MB 811: Dissertation I & MB 812: Dissertation II	• Collection of qualitative and quantitative data, • Data presentation-Tables and Graphs (Histogram, bar, pie and line) • Application of measures of central tendency and dispersion to the data • Collection of samples from different eco-systems • Isolation and characterisation of microbes. • CO-6- Application of microbes

Department of Statistics

Program outcome : B.Sc.(Statistics)	
1.	To understand the statistical methods and increase problem solving ability.
2.	To acquire the strong foundation of statistical concepts which will benefit them in a master's degree.
3.	To use the knowledge of Statistical tools and techniques in solving real life problems/situations.
4.	To acquire the knowledge of statistical software for problem solving.
5.	To prepare students for entrance examinations.

Program outcome : M.Sc. (Statistics)	
1.	To have specialized knowledge and understanding of statistical theory at an advanced level which take into account recent advances in the subject.
2.	To acquire the strong foundation of statistical concepts which will benefit them to become good academicians.
3.	To use acquired statistical methodologies and modelling techniques to address real-life problems.
4.	To gain the knowledge of software which has the wide range of opportunities in the Quality control, Planning and development, IT sector, R&D in industries, Business, Government and private sectors etc.
5.	To prepare students for various examinations like National / State level ISS, DSO, CSIR-UGC NET, SLET, GATE, MPSC, UPSC, Banking etc.
6.	To inculcate research attitude.

Program Specific outcome : B.Sc. (Statistics)	
1.	Understand the statistical theory with applications.
2.	To imbibe problem-solving and computational skills.
3.	To enhance self learning and improve own performance.
4.	Gain the knowledge of software which will be useful in Industry.
5.	To get ability in applying the theory/ tools/techniques of statistics in project work .

Program Specific outcome : M.Sc.(Statistics)	
1.	To understand, implement and develop statistical models.
2.	To handle and analyze small as well as large databases with computer skills.
3.	To describe complex statistical ideas to non-statisticians and to present the results of their analyses in written, oral forms and can make practical suggestions for improvement.
4.	To get a wide range of statistical skills in problem-solving.
5.	To prepare students for taking prominent roles in a wide spectrum of employment and research through project work and presentations.

Course Outcomes of S.Y. B.Com. (Business Statistics-I)

Class	Course title	Outcome
SYB.Com	Business Statistics-I	• CO1: Understand and Master the concepts, techniques and statistical methods and operations research. • Develop the skills of solving real life problems using Statistical Methods. • Make students understand the art of applying statistical techniques to solve real life problems. • Gain knowledge of Statistical Computations.
T.Y.B.Com	Business Statistics-II	• Distinguish between random and non-random experiments. • Find the probabilities of the events. • Apply standard distribution to different situations. • Test the hypothesis.
T.Y.B.Com	Business Statistics-III	• Study different optimization techniques. • Study different control charts. • Study simulation technique.

Course Outcomes of BSc (Statistics):

Class	Course title	Outcome
FYBSc (Paper-I)	**ST 111: Descriptive Statistics**	• Compute various measures of central tendency, dispersion, skewness and kurtosis. • Analyze data pertaining to attributes and to interpret the results. • Compute the correlation coefficient for bivariate data and interpret it. • Fit linear, quadratic and exponential curves to the bivariate data to investigate the relation between two variables. • Compute and interpret various index numbers.
FYBSc- (Paper-II)	**ST 112: Discrete Probability and probability distributions**	• Distinguish between random and nonrandom experiments. • Obtain probabilities of events. • Obtain probability distribution of random variable in the given situation • Apply standard discrete probability distributions to different situations.
FYBSc- (Paper-III)	**ST 113: Practicals**	• Use various graphical and diagrammatic techniques and interpretation.

		• Analyse data pertaining to discrete and continuous variables and to interpret the results, • Compute various measures of central tendency, dispersion, skewness and kurtosis. • Interpret summary statistics of computer output. • Summarize and analyze the data using computer. • Analyzing, interpreting and writing project report on real life situation.

SYBSc (Semester I)

SYBSc-(Paper-I)	ST 211: Discrete Probability Distributions, Time Series and R-Software	• Apply the discrete distributions in real life problem. • Understand the concept of time series with its components. • Understand basics of R environment. • Perform various operations on data in R
SYBSc (Paper-II)	ST 212: Continuous Probability Distribution -I	• Obtain summary statistics of a continuous random variable. • Obtain probability of events related to continuous random variable. • Identify whether variables are independent. • Obtain correlation and regression lines,m.g.f. moments, probabilities for bivariate continuous random variable. • Explain probability distributions,nature of curve, properties of continuous uniform,exponential,normal,gamma distributions and relations between them.

SYBSc (Semester II)

SYBSc (Paper-I)	ST 221: Statistical Methods and Use of R-Software	• Understand multiple linear regression models with applications. • Formulate the null and alternative hypotheses and apply small, large sample tests in real life problems. • Understand the different ways of summarizing the Vital Statistics. • Formulate M/M/1 queue and find its parameter alsofind the average waiting time in queue.
SYBSc (Paper-II)	ST 222: Sampling Distributions and inference	• Derive probability distribution function of chi-square, t, F distribution • Explains interrelation between the above distributions and their properties. • Get familiar with statistical tests of hypothesis and are able

		to apply in real life situations in various fields.
SYBSc (Paper-III)	ST 223: Practicals	• Real life applications of various discrete and continuous distributions. • Perform various operations on data in R- Software and MS- Excel. • Do descriptive statistical analysis in R- Software and MS-Excel. • Perform different large and small sample test using R-Software and MS- Excel.

TYBSc (Semester I)

TYBSc (Paper-I)	ST 331: Distribution Theory	• Prove students with a formal treatment of probability theory. • Equip students with essential tools for statistical analyses at the graduate level. • Foster understanding through real-world statistical applications. • Understand techniques for quantifying these uncertainties.
TYBSc (Paper-II)	ST 332:Theory of Estimation	• Understand meaning of Statistical Inference. • Know the methods of Estimation. • Study characteristics of good estimator.
TYBSc (Paper-III)	ST 333 Sampling Methods	• Understand the basic principles of sample survey. • Apply the different sampling methods for designing and selecting a sample from a population. • Implement Ratio and Regression estimation in real life problems. • To understand the role of sample survey in Research.
TYBSc (Paper-IV)	ST-334: Design of Experiments	• Understand the concept of ANOVA and basic principles of DOE. • Analyze the data using CRD, RBD, LSD and factorial experiments. • Understand the concept of ANOCOVA with real life situations. • Study the Application of confounding in real life problems.
TYBSc (Paper-V)	ST 335: C Programming (Turbo C)	• Learn the basics of Turbo C. • Use control structures such as if...else, for loop, while loop. • Write program using arrays. • Create recursive and non-recursive functions in C. • Write small as well as long programs in C.
TYBSc (Paper-VI)	ST 336: Introduction to Regression	• Apply simple linear regression model to real life examples. • Understand multiple linear regression models with

	Analysis	applications. • Compute multiple and partial correlation and checking residual diagnostic to validate model. • Apply Logistic models and its implementation in real life situation.

TYBSc (Semester II)

TYBSc (Paper-I)	ST 341 Actuarial Statistics	• Understand the utility theory, insurance products and life tables. • Understand the concept of interest • Understand the concept of life insurance and the existing insurance products of different insurance company. • Know life annuities, net premium.
TYBSc (Paper-II)	ST 342: Testing of Hypotheses	• Study MP test, UMP test, LR test, SPR test. • Understand the difference between MP, UMP,LR,and SPR tests. • Understand the difference between parametric and nonparametric tests. • Study various non-parametric tests.
TYBSc (Paper-III)	ST 343: Statistical Quality Control	• Understand online and offline process controls. • Apply X-bar chart, R-chart, C-chart and P-chart in real life data. • Apply the acceptance sampling plans in production process. • Compute capability indices.
TYBSc (Paper-IV)	ST 344: Operation Research	• Understand the need of operation research for effective decision making. • Formulate the dual LP Problem and understand the relation between primal and dual LP problems. • Solve artificial variable technique, duality theory, revised simplex method, sensitivity analysis, transportation and assignment problems. • Solve real life problems using integer programming.
TYBSc (Paper-V)	ST 345 (A): Reliability and Survival Analysis	• Understand the elements of reliability, hazard function and its applications. • Understand the concept of censoring, life distributions and ageing classes. • Estimate nonparametric survival function of the data. • Explain test of exponentiality against nonparametric classes, two sample problems.
TYBSc (Paper-VI)	ST 346: Statistical	• Learn the basics of R with descriptive statistics (measures of central tendency and dispersion). Import, review,

	Computing using R software	manipulate and summarize data-sets in R. • Visualization of the data through different diagrams (simple, multiple and sub-divided bar diagram) and graphs (histogram, frequency polygon, stem and leaf plot, boxplot). • Compute probabilities and fitting of probability distribution with R environment. • Perform correlation, regression analysis and appropriate statistical tests for real life situations using R. • Perform non-parametric tests for real life data sets.
TYBSc (Paper-VII)	Practical Paper I	• Apply and fit continuous distribution to real life situations. • Perform parametric and non-parametric tests. • Perform sampling methods analysis. • Calculate accumulated value, present value, effective rate of discount and benefit premiums. • Construct life tables.
TYBSc (Paper-VIII)	Practical Paper II	• Analyse data using various designs like RBD,LSD, Factorial. • Find efficiency of designs and its comparison. • Draw various charts, check the status of process and revising the limits to bring the process under control. • Study lot quality • Find optimal solution using various techniques like LPP, TP, AP. • Find optimum project completion path and probability of completion of project.
TYBSc (Paper-IX)	Practical Paper III	• Write short and long programs in C. • Create recursive and non-recursive function in C. • Perform simple, multiple and logistic regression analysis using R-software. • Perform parametric and non-parametric test using R-software. • Analyse real life data sets using R-software.

Course Outcomes of M.A/M.Sc (Statistics):

Semester I

Class	Course title	Outcome
M.Sc.I	ST-11: Mathematical Analysis	• Apply fundamental concepts of Real Analysis. • Define and recognize sequence, series of real numbers. • Understand and recognize various continuous and discontinuous functions. • Gain knowledge about differentiability of real functions and to apply related theorems to solve various examples.

M.Sc.I	ST-12: Integral Calculus and statistical Computing	• To study Riemann and Riemann-Stieltjes Integral and it's applications in Statistics. • Solve integrals and evaluation of multiple integrals with numerical problems. • Use of integration to find the area under curve and the area between curves. • To find local minima of a function using Gird search method , gradient search method and also using Newton's Raphson method.
M.Sc.I	ST-13: Linear Algebra	• Use the basic concepts of vector and matrix algebra for analysis of matrices, Vector space and systems of linear equations. • Use the characteristic polynomial to compute the eigen values and eigenvectors of a square matrix and use them to diagonalizable matrices when this is possible. • Understand the concept of G- inverse and MP G- inverse apply in real life situations. • Compute the quadratic forms, maxima and minima ratio of quadratic forms.
M.Sc.I	ST-14: Probability Distribution I	• Understand the most common discrete and continuous probability distributions and their real life applications. • Compute marginal and conditional distributions from joint distributions. • Get familiar with transformation of univariate and multivariate densities. • Understand the nature of data and to perform appropriate analysis.
M.Sc.I	ST-15: Probability Distribution II	• Understand continuous bivariate distributions. • Apply compound, truncated, mixture and non-central probability distributions to solve problems.
M.Sc.I	ST-16: Sampling Theory	• To apply unequal probability sampling designs viz.PPSWR, and determine the sample size for corresponding sampling technique. • Apply the stratified sampling methods for designing and selecting a sample from a population and concept of strata. • Implement Systematic sampling, Ratio and Regression estimation in real life problems. • Perform cluster sampling, two Stage sampling in real life situation.
M.Sc.I	ST-17: Practical-I	• Solve the system of linear equations using MATLAB/ R Software. • Verify Matrix algebra using MATLAB/ R Software. • Fit the distributions to a real life data using R-software.

		• Perform sampling methods analysis using Minitab-software.
M.Sc.I	ST-18: Practical-I	• To find critical points and use them to locate maxima and minima of a function using R Software /Matlab. • Use the Newton -Raphson method to solve a nonlinear equation using R-Software /Matlab. • To learn Monte carlo simulation technique for solving various types of problems using R-Software /Matlab.

Course Outcomes of M.A/M.Sc (Statistics):
Semester II

Class	Course title	Outcome
M.Sc.I	**ST-21: Probability Theory**	• Recognize common probability distributions for discrete and continuous variables. • Apply methods from algebra and calculus to derive the mean and variance for a range of probability distributions. • Calculate probabilities relevant to multivariate distributions, including marginal and conditional probabilities and the covariance of two random variables. • To study various inequalities.
M.Sc.I	**ST-22: Limit theorems and Convergences**	• Understand the concept of convergence, common methods for evaluating an inequalities performance and properties of desirable estimators. • Understand the central limit theorem and large-sample approximations for common statistics.
M.Sc.I	**ST-23: Regression Analysis**	• Apply simple and multiple linear regression model to real life examples. • Compute multiple and partial correlation and checking residual diagnostic to validate model. • Understand multiple linear regression models with applications and concept of lack of fit test, multicollinearity and autocorrelation. • Understand orthogonal polynomial and cubic spline regression model. • Understand logit transform, log link transform and different test for logistic and poisson regression. • Apply Non-linear regression models and its implementation in real life situation.
M.Sc.I	**ST-24: Parametric Inference**	• Obtain the sufficient statistic, minimal sufficient statistic for the parameter under study. • Obtain Fisher information matrix for special classes of

	(Estimation)	distributions. • Understand the concept of MVBUE, UMVUE. • Obtain confidence interval and apply the concept of Bayesian inference in real life situations.
M.Sc.I	**ST-25: Testing of Hypothesis**	• Understand and apply NP lemma and UMP test on real life data. • To apply MLR property and UMPU test with their applications.
M.Sc.I	**ST-26: Exploratory Multivariate Analysis**	• Find the distribution of linear transformation of a random vector. • Apply cluster analysis on real life data. • Perform data reduction using principal component analysis on real life data. • Demonstrate knowledge and understanding the basic ideas behind factor analysis and canonical correlation with applications.
M.Sc.I	**ST-27: Inference in Multivariate Analysis**	• Understand multivariate normal distribution and their real life applications. • Understand Wishart distribution, Hotelling T2 and Mahalanobis D2 statistic. • Implement dimension reduction techniques using software on real life problems. • Understanding the basic ideas behind discriminant analysis technique with applications.
M.Sc.I	**ST-28: Practicals- III**	• Perform simple and multiple regression analysis using Minitab software on real life problems. • Apply non- linear and logistic Regression models to real life situations. • Apply the central limit theorem and weak law of large numbers. • Explore multivariate data and its analysis. • Understand PCA, factor analysis, cluster analysis and discriminant analysis using software on real life problems. • Draw model sample from multivariate normal distribution and understand the application of Hotelling T^2 statistics.

Course Outcomes of M.A/M.Sc (Statistics):

Semester III

Class	Course title	Outcome
M.Sc. II	ST 31: Markov Chains	• Develop an ability to analyze and apply some basic stochastic processes for solving real life situations. • Understand the Markov chains and various types of

		states. • Learn use of absorbing state analysis for predicting future conditions. • Understand Gambler ruins problem and branching processes with applications.
M.Sc. II	ST 32: Design and Analysis of Experiments	• Understand the concept of BIBD, connectedness, balancedness and orthogonality of design. • Understand the difference between fixed and random effect models. • Compare the pairs of treatment means using different methods. Construct fractional factorial experiments and apply confounding in real life problems. • Construct the taguchi design. Apply the split plot design on real life examples.
M.Sc. II	ST 33: Asymptotic Inference	• Understand the concept of consistency and asymptotic normality. • Understand method of moments and percentiles, maximum likelihood to find consistent estimator and Cramer Huzurbazar theorem. • Apply likelihood ratio tests, Wald, Score and Bartlett's test in real life situations. • Compare various tests through relative asymptotic efficiency.
M.Sc. II	ST 34: Statistical Process Control	• Understand the concept of total quality management, six sigma approach • Understand basic of production process monitoring and apply the concept of control charts on it • Apply multivariate and non-parametric control chart to real life data sets • Compute capability indices • Apply the acceptance and continuous sampling plans in production process
M.Sc. II	ST 35: Practical IV	• Understand the concept of one-way and two-way classification using real life examples. • Analyse BIBD, covariance in one-way and two-way model. • Understand factorial design using real life problems. • Fit response surface models • Apply Taguchi methods to real life data sets
M.Sc. II	ST (E)36: Data Mining	• Organize and prepare the data needed for data mining using pre-processing techniques. • Understand unsupervised learning techniques for univariate and multivariate data.

		• Understand supervised learning techniques for moderate to high dimensional spaces. • Apply classification methods to real life problems in various fields.
M.Sc. II	ST (E)38: Optimization Technique	• Understand basics and formulation of linear programming problems. Apply simplex method to solve real life problems. • Solve the examples of sensitivity analysis, transportation, transshipment and assignment problems. • Understand the non-linear programming with their applications. • Understand the concept of PERT/ CPM with real life applications.

Course Outcomes of M.A/M.Sc (Statistics):
Semester IV

Class	Course title	Outcome
M.Sc. II	ST 41: Stochastic Processes	• Understand the stochastic processes and to learn birth and death process and application of Poisson process in real life situations. • Formulate and solve problems which involve setting up stochastic models. • Understand renewal theory and branching processes with applications. • To understand various components of queuing system and description of each of them.
M.Sc. II	ST 42: Time Series Analysis	• Understand the concept of time series with its components and able to compute ACVF and ACF. • Remove trend and seasonality using different methods to convert the time series into stationary. • Apply auto regressive, moving average, ARMA, ARIMA models, Box-Jenkins approach to forecast time-series data empirically. • Check and validate models with its residual analysis and diagnostic checking
M.Sc. II	ST 43: Actuarial Statistics	• Understand the concept of survival function and future life time random variable with the application of life table • Calculate the premiums for continuous and discrete set up for different types of policies • Calculate reserves for continuous and discrete set up for different types of policies

M.Sc. II	ST 44: Survival Analysis	• Understand the basic principles of sample survey. • Understand the concept of hazard function and its applications. • Understand the concept of censoring, life distributions and ageing classes. • Estimate nonparametric survival function of the data. • Apply test of exponentiality against nonparametric classes, two sample problems.
M.Sc. II	ST-45: Practical V	• Analyse time series models. • Analyse different time series models such as ARIMA, SARIMA, etc. • Understand non-parametric models for forecasting. • Realization of markov chain • Realization of poisson process, birth and death process, etc. • Analysis of complete and censored data. • Calculate accumulated value, net premiums and reserves • Construct life tables

Department of Commerce

- **Program Outcome:**

The Bachelor of Commerce students requires three years of full time study. The College offered a number of specializations and practical exposures which would equip the student to face the modern-day challenges in commerce and business.

It aims to provide students with knowledge, skills to understand and participate in modern business and economic world. After completing three years for Bachelor of Commerce program, students would gain a thorough knowledge in the fundamentals of Commerce, Finance, Marketing, Environment, Management, costing etc. with the abilities of developing entrepreneurial skills and abilities.

- Practical Exposure that would equip the students to face the challenges in modern era in commerce and business.
- The course offers a number of values based and job oriented skills to ensure that students become enables to feet for every challenging situation.
- Proficiency for completing various professional courses like Management, CA.,CMA.,CS.,MBA and Law
- Ability to recognise the role of businessman, entrepreneurs, consultants etc.
- Thorough knowledge of fundamentals of Commerce, Trade, Economics, Management etc.
- Expertise in way to contribute towards the development of new practices and procedure of Administration, Banking and finance, Entrepreneurship, Marketing, Insurance, Computers, Laws, Accountancy etc.
- Students become competent to demonstrate the role of Accountant, Manager, Advisor, Analyser etc. in society and business.

- Learners will be able to do higher education and advance research in the field of commerce and finance.

Courses Outcome: B.Com	
F. Y. B. COM.	
Course	**Outcomes:** After completion of these course students should be able to
102 Financial Accounting.	▪ Students acquainted with the knowledge of various accounting concepts. ▪ Students become knowledgeable about accounting procedures, methods and techniques. ▪ Acquaint them with practical approach to accounts writing by using software package e.g. Tally ERP-9, SAP etc.
104 (A) Business Mathematics and Statistics	▪ Students are prepared for competitive examinations by inculcating them with the concept of Simple interest, compound interest and the concept of EMI. ▪ Imparted the concept of shares and to calculate Dividend, concept of population and sample. ▪ They knew how to calculate various types of averages and variations along with the application of profit and loss in business.
104 (B) Computer Fundamentals	▪ Students get knowledge about the Computer environment and the basics of Operating System, basics of Network, Internet and related concepts. ▪ Students become aware about applications of Internet in Commerce. ▪ Enable students to develop their own web site.
105 Organizational Skill Developments.	▪ On successful completion of this subject the students acquires the Knowledge about the various types of business organizations, office management and related practices.
106 Essentials of E-Commerce	▪ Students become familiar with the mechanism of conducting business transactions through electronic media. ▪ Students are able to explain various components of e-commerce, understand the dynamics of e-commerce, appreciate the Internet technology and its utility in commercial activities, understand the methodology of online business dealings using e-commerce infrastructure
106 B Insurance and Transport	▪ Students become knowledgeable on various insurance aspects and the importance of transport facility to a business.
106 C Marketing and Salesmanship [Fundamentals of Marketing]	▪ On successful completion of this course the students should get the practical knowledge and the tactics in the marketing
106 D Consumer	▪ The students have understood consumer motivation and

Protection and Business Ethics	perception, Learnt consumer protection act 1986.
106 E Business Environment & Entrepreneurship	▪ With this subject students are motivated to make their mind set for taking up entrepreneurship as a career.
SYBCOM	
201 Business Communication	▪ Students will able to communicate in the language of business. ▪ Developing intellectual, personal and professional abilities through effective communicative skills; ensuring high standard of behavioural attitude through literary subjects and shaping the students socially responsible citizens.
202 Corporate Accounting	▪ To enable the students to be aware on the Corporate Accounting in conformity with the provision of the Companies Act 2013. ▪ After the successful completion of the course the student should have a through knowledge on the accounting practice prevailing in the Corporate world.
204 Business Management	• The students get the understandings of Principles & functions of Management, Process of decision making, and modern trends in management process.
205 Elements of Company Law.	▪ Enlighten the students' knowledge on Companies Act 2013 and Secretarial practices.
206 A Business Administration	▪ Students are inculcated with the basic knowledge about various forms of business organizations, business environment and its implications thereon. ▪ They will be able to aware with the latest trends in business.
206 E Cost and Works Accounting	▪ Enables the students to inculcate knowledge on Cost sheet, Material issues, Labour cost, Financial statement analysis, Budgeting etc.
206 G Business Entrepreneurship.	▪ The student will be well versed in Concept relating to entrepreneur and knowledge in the finance institution.
206 H Marketing Management	▪ Enable the student to understand the Principles of marketing management, market segmentation Product life cycle, pricing, branding etc.
206 K Insurance Transport and Clearance	▪ Aquatint skills needed to manage insurance business, the importance of insurance and tourism to a business.
206 L Computer Programming and Application.	▪ Students learn to use VBScript, transform Web pages from static text and images into functional, interactive, and dynamic e-commerce tools. ▪ They Learn to embed VBScript code in an HTML document, use VBScript operators; write code that makes decisions based on existing conditions, using control structures and loops, Web page visitor using Message and Input boxes,use the DOM to control the layout of HTML pages, add effects, and get information from users.

TYBCOM	
301 Business Regulatory Framework (Mercantile Law)	▪ Enables to inculcate knowledge on various laws relating to business such as law of contract, law of sale of goods, law of agency, Negotiable Instruments Act etc.
302 Advanced Accounting.	▪ Providing entire coverage of advanced accountancy. ▪ Acquired knowledge on preparation of departmental accounts with respect to Apportionment of overheads.
304 Auditing & Taxation	▪ Creating basic conceptual knowledge about the auditing principles. ▪ Understanding the basic concepts and to acquire knowledge about Computation of Income, Submission of Income Tax Return, Advance Tax, and Tax deducted at Source, Tax Collection Authorities under the Income Tax Act, 1961.
305 A Business Administration Special Paper II	▪ Acquaint the students with basic concepts & functions of HRD and nature of Marketing functions of a business enterprise
305 E Cost and Works Accounting Special Paper II	▪ The students gets a thorough knowledge on the cost accounting principles and the methods of cost accounting.
305 G Business Entrepreneurship Special Paper II	▪ Acquainted the students with the basic concepts of entrepreneurship and preparing a business plan to start a small industry and developed the Knowledge and understanding in creating and managing new ventures.
305 H Marketing Management Special Paper II	▪ Enable the students to understand the Principles of marketing management, market segmentation Product life cycle, pricing, branding, advertising, sales promotions, marketing research and CRM.
305 K Insurance Transport and Clearance Special Paper II	▪ Promoting the awareness of Insurance Business & practices by making they learn the various regulations relating to Life Insurance & General Insurance.
305 I Computer Programming and Application Special Paper II	▪ Inculcate knowledge on Networking concepts and technologies like wireless, broadband and Bluetooth. ▪ Meet the security requirements of the SLAs and other external requirements further to contracts, legislation and externally imposed policies.
306 A Business Administration Special Paper III	• Acquaint the students with the basic concepts in finance and production functions of a business enterprise
306 E Cost and Works Accounting	▪ Imparted the knowledge regarding costing techniques, concepts, procedures and legal Provisions of cost audit

Special Paper III	
306 G Business Entrepreneurship Special Paper III	▪ Students are aware to develop the Knowledge and understanding of behavioural aspects of entrepreneurship. Through studying the autobiographies of various entrepreneurs.
306 H Marketing Management Special Paper III	▪ Enable to inculcate the knowledge of brand and Distribution Management in marketing plus making them aware about importance of control on marketing activities
306 K Insurance Transport and Clearance Special Paper III	▪ Students understand the significance of travel and tourism industry. ▪ They study the functions and working of various Travel Organizations. ▪ Understand the concept of marketing mix and recent trends with Global Tourism and Transport Business.
306 I Computer Programming and Application Special Paper III	▪ Students understand the software project management and project planning also show how graphical schedule representations are used by project management and the risk management process.

Program Specific outcome UG:

- To develop numerical abilities of students
- To develop business language abilities of students
- To inculcate writing skills and Business correspondence.
- To create awareness of Law and Legislations related to commerce and business.
- To introduce recent Trends in Business, Organizations and Industries.
- To inform about Business Environment of Country as well as World
- To acquire practical skills related with commerce, trade, banking and finance.
- To provide a platform for overall development of students and develop knowledge level and awareness of students about Recent Trends of World.

Course Outcome: M. Com.

MCOM-I SEM-I	
Course	**Outcomes:** After completion of these course students should be able to
101 Management Accounting	• Students will enable to explain the relationship between cost accounting-financial accounting and managerial accounting. • CO2 They can answer the importance of management

	accounting for businesses. • Students will get the knowledge about the budgeting and operating budgets concepts. • They can Prepares both the operating and financial budgets
103 Advanced Accounting and Taxation Special Paper I	• Students can able to apply the theoretical foundation of Accounting and Accounting Standards in practical approach. • They can gain ability to solve problems relating to Company Accounts, Valuations and special types of situations.
104 Advanced Accounting and Taxation Special Paper II	• Students can able to compute the taxable income of individual and partnership firm. • Students can apply the knowledge of Income Tax and use it in filling the Income Tax Return of 'Individual', 'Hindu Undivided Family' and 'Firm' assesses.
107 Advanced Cost Accounting and Cost System Special Paper I	• Students will enable explain the costing concept and methods and Analyse the unit cost and job costing, process costing with normal and abnormal loss. • they can be able to analyse standard costing methods and prepare the reconciliations statements
108 Advanced Cost Accounting and Cost System Special Paper II	• Students Explain equip the students for designing and implementing cost control, cost reduction programme and different cost system. • They can implement the Cost Accounting Standard in practice with the level of knowledge with Advanced Techniques of Costing • CO3 The students can differentiate between Cost Accounting and Global Competitive environment. • They also enables to learn application of different methods of costing in Manufacturing and Service Industry.
113 Business Administration Special Paper I	• Students will able to explain and critically analyze the basic concepts & techniques of Production and operations management.
114 Business Administration Special Paper II	• The post graduate students can take the decisions of Investment with the help of Financial Statements. • They also able to analyse the Financial Statements.
MCOM-I SEM-II	
201 Financial Analysis & Control	• Students can acquire sound knowledge of concepts, methods and techniques of management accounting and to make the students develop competence with their usage in managerial decision making and control.
203 Advanced Accounting and Taxation Special Paper III	• Develop competency of students to solve problems relating Special areas in accounting including accounting for Services Sector and also the knowledge of Financial

	Reporting Practices. • They will be familiarize the student with procedure of accounting for Taxation.
204 Advanced Accounting and Taxation Special Paper IV	• They can understand the concept of Direct Taxes including Rules pertaining thereto and their application to different business situations and principles underlying the Service Tax, basic concepts of VAT, Excise Duty and Customs Duty.
207 Advanced Cost Accounting and Cost System Special Paper III.	• The post graduate students can use the knowledge on advanced cost accounting practices and Relevant Cost Accounting Standard are to be studied.
208 Advanced Cost Accounting and Cost System Special Paper IV	• The students will be answer and design the implement cost control, cost reduction programme and different cost systems and Relevant Cost Accounting Standards are to be studied.
213 Business Administration Special Paper III.	• They will get the Knowledge about the chambers of commerce and trade, Associations, Public enterprises and Public utilities.
MCOM-II SEM-III	
301 Business Finance	• Students will acquire sound knowledge of concepts, nature and structure of business finance.
302 Research Methodology for Business.	• Students will enable to get the knowledge about the areas of Business Research Activities and capabilities of students to conduct the research in the field of business and social sciences. • Students will acquaint, in developing the most appropriate methodology for their research studies and familiar with the art of using different research methods and techniques.
303 Advanced Accounting and Taxation Special Paper V	• They will get the knowledge and develop understanding of methods of auditing and their application
304 Advanced Accounting and Taxation Special Paper VI	• Students will enable to answer and develop the methods of audit in Specialized areas
307 Advanced Cost Accounting and Cost System Special Paper V	• Students can acquire adequate knowledge on Cost Audit Practices. Level of Knowledge.
308 Advanced Cost Accounting and Cost System Special Paper VI.	• The students with the knowledge of the techniques and methods of planning and executing the Management Audit. Level of Knowledge.
313 Business Administration Special Paper V	• The students understand various concepts of organisation behaviour and depth knowledge about process of formation of group behaviour in an organization set up

314 Business Administration Special Paper VI	• The students get with in-depth knowledge of HRM and understanding about recent trends in HRM
MCOM-II SEM-IV	
401 Capital Market and Financial Services	• Students can acquire sound knowledge, concept and structure of capital market and financial services.
403 Advanced Accounting and Taxation Special Paper VII.	• The students familiarise with latest developments in the Subject and inculcate the habit of referring to various periodicals and publications in the given subject, apart from text books and reference books • They will be able to read, understand, interpret and Summarize various articles from newspapers, journals etc.
407 Advanced Cost Accounting and Cost System Special Paper VII	• Get the knowledge on recent advances in cost accounting and cost systems
413 Business Administration Special Paper VII.	• The students will familiarise with the recent advancements in business administration and understanding about tools and their application in the business.

Program Specific outcome PG:

- Enriched knowledge with new ideas and techniques essential for business and management
- Mastery over specific skills in business.
- Capability to acquire and handle any position in business.
- Develop analytical interpretative and presentation skill regarding research in business and management.
- Acquaintance with recent trends in commerce and management.

Course Outcome: M. Phil. (Commerce)

	Course	Outcomes:
1	Research methodology for Commerce	• This paper helps the students to understand the research techniques, sampling etc. in business research. • The students can able to answer the solutions for the problems encounter in the current era. • Students can analyse the contemporary issues with the help of research methodologies and its application for the sake human life. • Students can be able to acquaint with the applications of research and its implementation through the trade policies in business surroundings and environment. • They can learn to use strategies and skills in research and its application for the development of industry.
2	Recent Trends in Commerce and Business Management	• It helps the students to compare the recent trends with the traditional one. • Student can enlighten the society with the help of knowledge about new trends and issues in the business market. • The students understand the organizational etiquettes, group behaviour, leadership qualities and analysing the attitude of the employee. • Aiming to enable the students to get the Know-how of corporate governance in its wide aspects. • Researchers can understand the emerging trend and challenges related with the business and commerce institutions in wide aspects IV. • They can provide knowledge about business policies and various business models.
3	Business Administration	• Research students will learn effectively to communicate in the context of business. • They will learn to collaborate in a business environment • They will learn to act ethically in businesses. • Research students will demonstrate a mastery of the core functional areas of business including accounting, economics/finance, marketing, management, planning & strategy. • It can create awareness about contemporary issues

		concern with business administrative theories.

Program Specific outcome M. Phil and Ph. D. :	
	PhD and M.Phil students get acquainted with the following specific outcomes by learning their specific courses • The students get motivation for application of knowledge for the sake of society. • The programme also provides them with adequate knowledge and skill to provide consultancy service in finance and management. • Research cultures have been developed in the students through research methodologies. • Students can change their attitudes by having the knowledge of different subjects. • Students can develop their social maturity, business ethics and legal knowledge which is essential for developing the society.

Department of Geography

Program outcome: B.A./B.Sc./B.Com/B.Voc. (Geography)	
1.	Study the types of land and processes
2.	Understand the structure, composition of different spheres of the earth and its Atmosphere.
3.	Understand importance of oceans, rivers and water and find the ways of their conservation
4.	Understand the Function and types of Biogeography.
5.	Understand the science of Remote Sensing Make use of GIS & GPS software

Program outcome: M.A./M.Sc./M.Com. (Geography)	
1.	Study the types of land and processes
2.	Understand the structure, composition of different spheres of the earth and its Atmosphere.
3.	Understand importance of oceans, rivers and water and find the ways of their conservation
4.	Understand the Function and types of Biogeography.
5.	Understand the science of Remote Sensing Make use of GIS & GPS software

Program Specificoutcome: B.A./B.Sc (Geography)	
1.	Serve as a Geographer
2.	Work as a teacher in schools and high schools
3.	Serve as conservator in forest, Soil, Agri, Departments.
4.	Work in disaster and water resources management.
5.	Serve in forest department as forest conservator.
6.	Serve in cartographer in map making divisions of Government.
7.	Work in NGOs.
8.	Can Prepare for Competitive exams

Program Specificoutcome: M.A./M.Sc./M.Com. (Geography)	
1.	**Govt Department**:A geographer can avail job opportunities in government departments (like planning and developmental commissions, forestry, environmental, and disaster management departments etc), travel agencies, manufacturing firms, text book and map publishers, media agencies, etc.
2.	Cartographer: Many people choose to work as a cartographer who is a person with extensive knowledge about maps and is involved in making maps, charts, globes, and models of Earth and other planets.
3.	Surveyor: Many others with a degree in geography also opt to work as a surveyor.
4.	GPS Surveyors: In recent days even the fields of GIS as well as Remote Sensing are providing job opportunities to people with the educational background in geography and related specializations
5.	GIS and Remote Sensing Fields: Geography as a career provides multiple job

	options.
6.	Drafter: He/she associate closely with engineers and architectures. It involves planning, housing and development projects in terms of their location and utilization.
7.	Government employer: Central government agencies employ geographers for mapping, intelligence work and remote sensing interpretation. State and local governments employ geographers on planning and development commissions.
8.	Urban and regional planner: Concerned with planning, housing and Development projects with respect to their location and utilization of available land-space.
9.	GIS specialist: City governments, county agencies and other government agencies and private groups are often in need of experienced GIS professionals.
10.	Climatologist: Agencies viz. National Weather Service, news media, the Weather Channel and other government entities occasionally need climatologist.
11.	Transportation manager: The regional transit authorities or shipping, logistics and transportation companies requires in transportation geography.
12.	Researcher: Many Government and non-government institutes along with research centres offers several career options for qualified geographers with numerous specializations.
13.	Teacher/Professor: The college teachers, school teachers and university teacher. Depending upon the experience and degrees obtained
14.	Demographer: In government and research organizations.
15.	Government officer: Geographical Survey of India/State and Central government provides job opportunities
16.	It is learn that in the NET/SET, MPSC/UPSC and other competitive examinations.
17.	Digitizers in GIS Company

Course Outcomes of BA (Geography):

Class	Course title	Outcome
FYBA	GG110- Elements of Geomorphology	• Understand the effect of rotation of revolution the Earth • Understand interior structure of the earth with diagram. • Know the importance of longitudes & latitudes • International Date line and Standard time • Understand Theory regarding of Origin of Continents and oceans • Study the formation of Rocks ant their types. • Understand the work of internal and external forces and their associated Landforms. • Study the erosional and depositional land forms of Rivers and Sea Waves. • Understand the concept of mass Wasting • Understand the Application of Geomorphology
SYBA	GG 210- Elements of	• Understand the importance of Atmosphere and related concepts.

	climatology and oceanography	• Understand heat balance and difference between heat and temperature. • Understand the types of winds and local winds. • Understand the structure, composition of Atmosphere and vertical as well as horizontal variation. • Understand weather phenomena winds, humidity and precipitation. • Understand properties of ocean water and its characteristics. • Knowledge about effect of ocean Currents and its causes. • Study about types of tides. • Study of costal environment and Ocean Resources and its utilization.
SYBA	GG 220-Economic Geography	• Study the Human Economic Activities • Explain the Weber theory of Industrial Location 3. Understand the mineral and power resources • Study conventional and non-conventional energy resources Department of Geography • Study of the distribution of Iron and Steel, Automobile, Cotton Paper and Ship Building Industries in India • Get knowledge about types of agriculture, trade and transport. • Aware the student about need of conservation and Protection of natural resources. • Study of Transport and Trade • Understand the concept of Privatization, Globalization and Liberalisation
SYBA	GG 201-Fundaments of Geographical analysis	• Acquired the Plan Table and Prismatic Compass surviving techniques. • Known the components and function of GPS • Acquired Skills of handling GPS and Conducted GPS Survey • Measure Map Scales, conversion of scales • Understand types of projections • Preparation of various graphs and diagrams • Get knowledge about Statistical Methods. • Understand the different surviving techniques like, plane table, prismatic survey. • Acquire knowledge of preparation of drawing of profile with the help of Dumpy level. • Understand the socio economic condition of the villages.
TYBA	GG310-Regional geography of India	• Understand the about the physiographic division of India. • Understand the India Drainage system of India Rivers

		• Understand the climatic variation in India and climatic region of India. • Examine and understand the types of vegetation of India. • Understand the variation in industrial development in India. • Examine and understand the developed and underdeveloped states in India.
TYBA	GG320-Agricultural Geography	• Understand approaches of agricultural geography and its examples • Know the silent feature, problems and prospects of Agriculture. • Study about types of agriculture and its subtypes. • Understand methods of irrigation and modes of same. • Know the Importance of water Resources. • Study about water harvesting concept and methods. • Study allied areas in agriculture and agriculture development with examples. • Study the Problems and Prospect of Agriculture with reference to India • Understand sustainable agricultural development and initiatives.
TYBA	GG 301Techniques of spatial analysis	• know about Toposheets and its types • Understand the mechanism function of • Topographical maps. • Understand interpretation if weather images. • Understand the History of Remote Sensing • Know Arial Photographs and Satellite Imageries • Understand method of representation of relief. • Introduce the student of top sheet, weather map. • Understand the basic concept of RS GIS& GPS. • Mapping and interpretation of Arial Photograph.

Course Outcomes of BSc (Geography):

Class	Course title	Outcome
FYBSc (Paper-I)	GG 110 Geomorphology	• Understand the nature, scope and significance of geomorphology and fundamental concepts in subject. • To examining the Origin and Evolution of the earth primary relief features by different theories in subject. • Understand about Exogenous Processes considering weathering and mass wasting and nature and types of the slope. • Evaluate the fundamental Model of Davisian Cycle of Erosion to learn the function of fiver and its landforms

		development process. • Understand formation, process and development of Fluvial and Karst Landforms
FYBSc-(Paper-II)	Climatology and oceanography	• Understand the meaning, nature and scope, modern trends in Oceanography. • Understand the ocean floor and relief of the ocean bottom. • Understand the properties like temperature, density, salinity of ocean water. • Understand the characteristics and properties of factors affecting on formation of sea waves. • Understand the difference between weather & climate and aims, nature, scope of climatology. • Understand the origin, composition and structure of atmosphere • Getting facts about Heat Budget and factors effects Heat Budget. • Understand the concept of horizontal, vertical temperature and inversion of temperature. • Identify the Atmospheric pressure and winds humidity and concept of precipitation and its types.
FYBSc-(Paper-III)	Techniques in physical geography	• Acquire the knowledge of various techniques in Physical Geography. • Enable to use techniques of specific maps and their geographical interpretation. • Students acquainted with the weather instruments and their utility and applications in geographical phenomena

Semester I

SYBSc-(Paper-I)	GG211 Geography of resources	• Understand the Importance of water, Soil, Land and Forest Resources. • Introduce the techniques resources conservation
SYBSc (Paper-II)	GG 212 watershed management	• To acquaint the students with concepts in Watershed Management. • To familiarize the students with the importance of Watershed Management • Understand the fundamentals concepts related to watershed, significances of watershed development, demarcation of watershed, types of watershed according to area and shape

Semester II

SYBSc	GG221	• Understand the Importance of water, Soil, Land and Forest

(Paper-I)	Geography of resources	Resources. • Introduce the techniques resources conservation
SYBSc (Paper-II)	GG 222 watershed management	• Study about the physical parameters of watershed, channel geometry and basin Morphology. • Understand the hydrological parameters, rainfall, aerial precipitation, evaporation and transpiration, infiltration, run off and drainage. • Understand the watershed development planning and sample of watershed management and planning for appropriate development of watershed management for water conservation and development.
SYBSc (Paper-III)	GG 201 Fundamental of Geographical analysis	• Measure Map Scales, conversion of scales • Understand types of projections • Preparation of various graphs and diagrams • Get knowledge about Statistical Methods. • Understand the different surviving techniques like, plane table, prismatic survey. • Acquire knowledge of preparation of drawing of profile with the help of Dumpy level. • Understand the socio economic condition of the village

Semester I

TYBSc (Paper-I)	GG 331 Fundamental of human Geography	• Study of human evolution and races of man kinds. • Understand the relationship of man and environment • Get knowledge of population theories.
TYBSc (Paper-II)	GG 332Geography of travel& tourism	• Study the tourism motivating factors for pilgrimages, leisure, recreation, elements • To Study tourism attraction, evolution of tourism, promotion of tourism.
TYBSc (Paper-III)	GG 333 Fundamental of Geoinformatics	• Understand potential of GIS, concept of space & time, objectives of GIS, elements of GIS, GIS tasks, history of GIS and GIS applications in different field. • To examine and understand the spatial and nonspatial data models and all its functions components and applications in geography.
TYBSc (Paper-IV)	Gg 334 Geography of India	• Understand the climatic variation in India and climatic region of India • Examine and understand the types of vegetation of India • Understand the about the physiographic division of India
TYBSc (Paper-V)	GG 335 Geography of soils	• Understand the nature, scope, and concept of soil geography • Understand physical and chemical properties of soil and

		factors affecting formation of soil. • Understand vertical structure of soil and soil horizon.
TYBSc (Paper-VI)	GG 336Fundaments of Geoinformatics	• Understand the modern techniques in geography under this course such as remote sensing and aerial photography. • Examining the history, basic theories of EMR, and other concepts.

Semester II

TYBSc (Paper-I)	GG 341 Fundamental of human Geography	• Study of human Settlement Understand the relationship of man and environment • Get knowledge of Economics theories.
TYBSc (Paper-II)	GG 342Geography of travel& tourism	• Study the types of accommodations in tourism Study the tourism motivating factors for pilgrimages, leisure, recreation, elements • To Study tourism attraction, evolution of tourism, promotion of tourism.
TYBSc (Paper-III)	GG 343 Fundamental of Geoinformatics	• Understand the data product, types of data product and its applications and uses in remote sensing • Understand potential of GIS, concept of space & time, objectives of GIS, elements of GIS, GIS tasks, history of GIS and GIS applications in different field. • To examine and understand the spatial and nonspatial data models and all its functions components and applications in geography.
TYBSc (Paper-IV)	Gg 344 Geography of India	• Understand the Mineral diffraction in India and climatic region of India • Examine and understand the types of energy resources • Understand the about the agriculture of India
TYBSc (Paper-V)	GG 345 Geography of soils	• Understand soil classification of USDA • Understand vertical texture of soil
TYBSc (Paper-VI)	GG 346Fundaments of Geoinformatics	• Understand the modern techniques in geography under this course such as remote sensing and aerial photography. • Examining the history, basic theories of RS.
TYBSc (Paper-VII)	GG 347Map analysis and field work	• Know about Toposheets and its types. • Understand the mechanism function of topographical maps • Understand the topographical maps, its introduction, types,

		index, grid reference, and interpretation of topographical maps
TYBSc (Paper-VIII)	GG 348 Techniques of spatial analysis	• Preparation of various graphs and diagrams • Get knowledge about Statistical Methods
TYBSc (Paper-IX)	GG 349Techniques in Geomorphology and soil analysis	• Understand physical Setting of the area • Understand the soil ph and other properties

Course Outcomes of M.A/M.Sc (Geography):

Semester I

Paper	Course title	Outcome
GG101	Principle of geomorphology	• Understand the nature, scope and significance of geomorphology and fundamental concepts in subject. • To examining the Origin and Evolution of the earth primary relief features by different theories in subject. • Understand about Exogenous Processes considering weathering and mass wasting and nature and types of the slope. • Evaluate the fundamental Model of Davisian Cycle of Erosion to learn the function of fiver and its landforms development process. • Understand formation, process and development of Fluvial and Karst Landforms • To recognize and understand the formation, process and development of Glacial and Aeolian Landforms in geomorphology
GG102	Principle of Climatology	• Understand the difference between weather & climate and aims, nature, scope of climatology. • Understand the origin, composition and structure of atmosphere • Getting facts about Heat Budget and factors effects Heat Budget. • Understand the concept of horizontal, vertical temperature and inversion of temperature. • Identify the Atmospheric pressure and winds humidity and concept of precipitation and its types.
GG103	Principle of Economic geography	• Aware the student about need of conservation of natural resources. • Understand the problems and prospects of IT Industry and

		Agro-based Industry. • Acquired detail knowledge of factors of Industry
GG104	Principle of Population & settlement of geography	• Understand the Nature and Scope of Population & Settlement Geography and their evolution, significance and approaches for the study. • Understand the settlement types, pattern and nature and process of urban settlement and some basic concept related to settlement geography. • Examine and understand the various factors responsible for World Population growth and Distribution. • To understand the fundamental Concepts Related to Population such as density, over, Optimum & under population, fertility, mortality and population for future Perspectives. • To review and understand the subject matter with the help of Theories of Population.
GG105	Practical in physical geography	• Understand the stream ordering methods of Stahlers and Harton and calculate the stream orders and bifurcation ratio • To study and understand the drainage basin analysis and prepare the slope map, dissection index map, relative relief map, absolute relief map • To understand and prepare the slope profile and their types and drawing the block diagram • To understand the Climograph, Hydher graph Climate graph. • To understand and classify climatic region using Koppen‟s and Thornwaite climatic classification methods
GG106	Practical in Human geography	• Students understand the statically crop combination methods. • To evaluate and understand agricultural efficiency with various methods • Evaluate the Data Analysis Techniques of measures network structure. • Understand & Draw Lorenz Curve and location quotient. • Understand population indices‟ and population projection Analysis • Applied and understand the data analysis techniques for rural and urban settlement And prepare the adequate maps, various Graphs

Course Outcomes of M.A/M.Sc (Geography):
Semester II

Paper	Course title	**Outcome**
GG 201	Quantitive techniques in Geography	• Understand the introduction of types of statistical and characteristics of geographical data, • Scales of measurement. • Clear the facts about the probability, types of probability and applications and uses indifferent field of geography. • Understand the concept of sampling and designing and conducting a sample survey for data collation and data analysis. • Evaluate, calculate and understand the parametric and non-parametric statistical tests. • Understand the correlation and regression analysis and their application in various field of geography
Gg 212	Agricultural geography	• Understand about the introduction to agriculture, nature, scope, significance and Development of agriculture geography, study approaches applied in agriculture. • Understand the influence of physical, Economic and Technological factors on agriculture patterns. • To understand the agricultural system its meaning and concept, whittlesey"s classification of agricultural system, types of agricultural, study the types of agricultural in respect of area, salient features and their problems. • Understand the agricultural regionalization and modes in agricultural geography and their classification of agricultural models and some theories. • Understand definition and characteristics of arid and semi-arid regions and study about droughts and famines, role of irrigation and dry farming.
Gg 222	Industrial geography	• Understand study about the industrial geography, its nature, scope, and different study Methods. • Knows the locations of industry and their activities primary and secondary and its factors responsible for same. • Review on world distribution of some industries and selected countries. • Understand the global nature of industrialization and related problems, methods of measuring the spatial distribution of manufacturing. • Understand the environmental degradation, industrial hazards and occupational health, manufacturing industry, role and factors affecting on the same.
Gg 202	Practical cartography	• Understand the types and scales of Data measurement. • Use data representation by various techniques of maps and

		Diagrams. • Understand the map projections definition and necessity of projections and types – perspective and non-perspective, conventional and classification of projection. • Understand and graphical construct the polyconic projection, international map projection, universal transverse Mercator (UTM) projection and mollweide projection.
GG203	Practical in surveying and field visit	• Understand the topographical maps, its introduction, types, index, grid reference, and interpretation of topographical maps • Study the satellite imageries- introduction, calculation of geographical area, interpretation of satellite imageries. • Understand the aerial photographs- introduction, definition, types, geometry of aerial photographs, methods, measurement of geographical area, elements of photo interpretation using stereoscope. • Study and understand the techniques of surveying, using dumpy level and theodolite for practical, field work, research, and measurement and management of area.
GG 204	Geography of tourism	• Understand the problems and prospects of Tourism Industry • Understand the major basis of tourism
GG 205	Disaster management	• Examining the introduction to disaster, nature, scope, significance, types and approaches to study. • Understand the fundamental concept of hazard, disaster, vulnerability, resilience and risk • Understand the various types and impact of natural and manmade hazards on human being, regional economy, nature etc. • Understand the role of local peoples, NGOs, police, army, paramilitary forces in disaster management • Study the previous disasters and their management happened in India
Gg 208	Geoinformatics	• Understand the modern techniques in geography under this course such as remote sensing and aerial photography. • Examining the history, basic theories of EMR, and other concepts. • Understand and get the knowledge about fundamental concept, types of aerial photography characteristics of aerial photographs and aerial camera. • Review on development of Indian remote sensing and functions of IRS.

		• To understand the types of remote sensing, and types of platforms in remote sensing. • To get an knowledge about satellite sensor and types of sensors, and their functions and characteristics Understand the data product, types of data product and its applications and uses in remote sensing
GG209	Geoinformatics - II	• Understand the modern techniques in geography under this course such as remote sensing and aerial photography. • Examining the history, basic theories of EMR, and other concepts. • Understand and get the knowledge about fundamental concept, types of aerial photography characteristics of aerial photographs and aerial camera. • Review on development of Indian remote sensing and functions of IRS. • To understand the types of remote sensing, and types of platforms in remote sensing. • To get an knowledge about satellite sensor and types of sensors, and their functions and characteristics

Course Outcomes of M.A/M.Sc (Geography):

Semester III

Paper	Course title	Outcome
GG 301	Geography of India with special reference to Maha.	• Understand the about the physiographic division of India and Maharashtra. • Understand the India Drainage system of India Rivers • Understand the climatic variation in India and climatic region of India and Maharashtra. • Examine and understand the types of vegetation of India and Maharashtra. • Understand the variation in industrial development in India and Maharashtra. • Examine and understand the developed and underdeveloped states in India.
GG 312	Trade and transport Geography	• Understand the history and development, nature, types, need and types of trade • Study the physical, economic, social and political factors influencing on international trade • Understand types, characteristics, merits and demerits of modes of transportation • Understand the role and significance various modes of transportation in local and international trade. • Understand the various problems of transportation in urban areas

GG 332	Practical in economic Geography	• Understand concepts of crop combination, Agricultural Efficiency and Agricultural Productivity. • Examine Location Quotient, Lorenz Curve, Gini‟s Coefficient and Von Thunean • Understand transport Network Analysis • Get information about gravity potential population surface model • Understand application Breaking Point theory (Trade Area)
GG303	Research methods in Geography	• Examining the introduction of research, motivation in research, types of research, significance of research, research process and criteria of good research. • To understand the research problems, selecting research problems, literature review and to study the hypothesis, its types, sources, formation of hypothesis and utility of hypothesis in scientific research. • To understand the research design, need, features basic principal and developing of research plan, and sampling design and its basic types, steps, characteristics of sampling design. • Study about type's data and methods of data collection and study the processing and analysis of data using different statistical methods. • Understand the interpretation and report writing, techniques, precaution of interpretation, layout of research report, types of reports and oral presentation mechanics of writing a research report.
GG 306	Geoinformatics-III	• Understand the modern techniques in geography under this course such as remote sensing and aerial photography. • Examining the history, basic theories of EMR, and other concepts. • Understand and get the knowledge about fundamental concept, types of aerial photography characteristics of aerial photographs and aerial camera. • Review on development of Indian remote sensing and functions of IRS. • To understand the types of remote sensing, and types of platforms in remote sensing. • To get an knowledge about satellite sensor and types of sensors, and their functions and characteristics Understand the data product, types of data product and its applications and uses in remote sensing
GG307	Practical in	• Understand the modern techniques in geography under this

	Geoinformatics	course such as remote sensing and aerial photography. • Examining the history, basic theories of EMR, and other concepts. • Understand and get the knowledge about fundamental concept, types of aerial photography characteristics of aerial photographs and aerial camera. • Review on development of Indian remote sensing and functions of IRS. • To understand the types of remote sensing, and types of platforms in remote sensing. • To get an knowledge about satellite sensor and types of sensors, and their functions and characteristics • Understand the data product, types of data product and its applications and uses in remote sensing
GG 302	Interpretation of topographical map & village survey /project work	• Introduce the student of top sheet and SOI and OS. • Understand interpretation of Topographical maps

Course Outcomes of M.A/M.Sc (Geography):
Semester IV

Paper	Course title	Outcome
GG401	Theoretical and applied geography	• Understand the historical development of geographical thought according to Greek, Roman, Indian, German, French, British and American school. • Understand the dualisms in geography such as determinism and possibilism, systematic Vs regional and physical Vs human geography. • Understand recent trends, scientific methods, quantitative revolution and computer application in geography. • Understand the definition, need, and signification of applied geography.
GG402	Principle of remote sensing and GIS	• Understand the all fundamental concept of GIS, potential of GIS, concept of space & time, objectives of GIS, elements of GIS, GIS tasks, history of GIS and GIS applications in different field. • To examine and understand the spatial and non spatial data models and all its functions components and applications in geography.

		• Extract the knowledge and information about geospatial analysis and database query and GIS data analysis the various concept and problems in analysed in GIS environment. • Understand the concept of map, projections, and coordinate systems and basic of the same for different purposes in geography. • GIS applied in the various kinds of fields, agriculture, populations, watershed planning and land use planning.
GG403	Practical in remote sensing and GIS	• Understand the modern techniques in geography under this course such as remote sensing and aerial photography. • Examining the history, basic theories of EMR, and other concepts. • Understand and get the knowledge about fundamental concept, types of aerial photography characteristics of aerial photographs and aerial camera. • Review on development of Indian remote sensing and functions of IRS. • To understand the types of remote sensing, and types of platforms in remote sensing. • To get an knowledge about satellite sensor and types of sensors, and their functions and characteristics • Understand the data product, types of data product and its applications and uses in remote sensing
GG423	Oceanography	• Understand the meaning, nature and scope, modern trends in Oceanography. • Understand the ocean floor and relief of the ocean bottom. • Understand the properties like temperature, density, salinity of ocean water. • Understand the characteristics and properties of factors affecting on formation of sea waves. • Understand the tides, tide generating forces, types of tides and tidal effects in coastal areas. • Get knowledge about distribution of lithogenous, biogenous, and hydrogenous sediments on ocean floor.
GG404	Geography of Food security of India	• Acquired detail comprehensive information of India's Food Security Bill 2013 • Understand merits and demerits of food Security in India • Understand current scenario of food security in India
GG 405	Geography of Health	• Understand fundamental concepts, approaches, development and challenges of health care in India. • Learn the geographical factors affecting on human health. • Get the knowledge of genetic, communicable, non-

		communicable and occupational diseases. • Understand diffusion of diseases and causes major diseases. • Understand rural environment and health and health problems of tribes in India. 6. Get the knowledge about urban environment and health; pollution.
GG 406	Practical in advance surveying	• Understand the modern techniques in geography under this course such as GPS • Understand and get the knowledge about fundamental concept, types of errors. • Understand how to conduct GPS Survey. • Understand importance of Total Station, Its Disadvantage and disadvantages. • Got knowledge about characteristics and functioning of Total Station. • Understand the data product, types of data product and its applications and uses in Total Station.

Department of English

Program outcome: B.A./B.Sc./B.Com/B.Voc. (English)	
1.	Communicate in English language fluently and effectively.
2.	Demonstrate the knowledge and understanding of English language and texts in English.
3.	Understand literary texts in English
4.	Understand and apply critical theories and texts in English.
5.	Understand the phonology, morphology, syntax, semantics and pragmatics of English language.

Program outcome : M.A./M.Sc./M.Com. (English)	
1.	Communicate in English language fluently and effectively.
2.	Demonstrate the knowledge and understanding of English language and texts in English.
3.	Understand literary texts in English
4.	Understand and apply critical theories and texts in English.
5.	Understand the phonology, morphology, syntax, semantics and pragmatics of English language.
6.	Understand the advanced discourses in English.
7.	Understand the advanced linguistic and stylistic theories.

Program Specific outcome : B.A./B.Sc./B.Com/B.Voc. (Subject)	
1.	Communicate in English language fluently and effectively.
2.	Demonstrate the knowledge and understanding of English language and texts in English.
3.	Understand literary texts in English
4.	Understand and apply critical theories and texts in English.
5.	Understand the phonology, morphology, syntax, semantics and pragmatics of English language.

Program Specific outcome : M.A./M.Sc./M.Com. (Subject)	
1.	Communicate in English language fluently and effectively.
2.	Demonstrate the knowledge and understanding of English language and texts in English.
3.	Understand literary texts in English
4.	Understand and apply critical theories and texts in English.
5.	Understand the phonology, morphology, syntax, semantics and pragmatics of English language.

Course Outcomes of BA (Subject):

Class	Course title	Outcome
FYBA	Compulsory English	• Students have acquainted with prose and poem • Students have been exposed to different cultural experiences and developed humane values • Students have improved their linguistic skills in English • Students have learnt various communication skills
FYBA	Optional English-I	• Students have understood literary devices employed in short story • Students have learnt the components of a literary piece and approaches of literature • Students have been familiarized with different genres of short story • They have followed technical aspects of short story writing
SYBA	Compulsory English	• Students have developed competence for self-learning • Students have familiarized with prose and poetry in English • Students have developed interest in literary pieces • Students have developed humane values • Students have learnt advanced Grammatical Concepts • Students have also mastered important written skills such as paragraph writing, report writing & letter writing
SYBA	Optional English-I	• Students have understood literary devices employed in short story • Students have learnt the components of a literary piece and approaches of literature • Students have been familiarized with different genres of short story • They have followed technical aspects of short story writing • Students have learnt advanced concepts in linguistics
SYBA	Special English-I	• Students have been acquainted with Shakespearean plays esp.tragi-comedy with reference to The Merchant of Venice • Students have understood features of Naturalistic and Realistic Theatre with reference to ADoll's House • Students have learnt about Indian Dramas in English
SYBA	Special English-II	• Students have learnt new terminology in poetry criticism • Students have learnt to appreciate poems • Students' aesthetic sense have improved • Students are able to read, appreciate and critically evaluate the poetry independently
TYBA	Compulsory	• Students have understood the difference in language of

	English	prose and poem • Students have been mesmerized by the communicative power of literature • Different stories from varied cultures have created awareness about variegated cultural experiences through literature • Students have learnt how to understand poetry • Soft skills of students have improved their communicative skills, presentation Skills have also improved
TYBA	Optional English-I	• Students have understood the difference in language of prose and poem • Students have been mesmerized by the communicative power of literature • Different stories from varied cultures have created awareness about variegated cultural experiences through literature • Students have learnt how to understand poetry • Soft skills of students have improved • Their communicative skills, presentation Skills have also improved
TYBA	Special English III	• Students have understood the elements of novel • Students have acquainted with different genres of short stories • Students have understood various revolutionary movements and philosophy of life • Students have learnt what is novel through examples of novels viz. The Old Man and the Sea and The Guide
TYBA	Special English-IV	• Students have understood the basic principles,nature and function of criticism • Students have learnt the development of criticism through ages • Students have acquired critically analyzing skills of poetry • Students have learnt new terms in literature
FYBCom	Compulsory English	• Students have acquainted with prose and poem • Students have been exposed to different cultural experiences and developed humane values • Students have improved their linguistic skills in English • Students have learnt various communication skills
FYBCom	Additional English	• Students have acquainted with prose and poem • Students have been exposed to different cultural experiences and developed humane values • Students have improved their linguistic skills in English Literary sensibilities

SYBSc-(Paper-I)	Additional English	• Students have acquainted with prose and poem • Students have been exposed to different cultural experiences and developed humane values • Students have improved their linguistic skills in English • Students have learnt various communication skills
SYBSc (Computer Science)	Compulsory English	• Students have acquainted with prose and poem • Students have been exposed to different cultural experiences and developed humane values • Students have improved their linguistic skills in English • Students have learnt various communication skills

Course Outcomes of M.A/M.Sc (Subject):

Semester I

Class	Course title	Outcome
M.A.	English Literature from 1550-1798	• Students have understood major movements and literary figures • Students have developed literary responsibility and sense of appreciation • Students have become adept to employ innovative methods in writing
M.A.	English Literature from 1798-2000	• Students have understood major movements and literary figures • Students have developed sense of appreciation
M.A.	Contemporary Studies in English Language	• Students have understood the basic tools of language • Students have understood the different concepts of language • They have understood different perspectives of language and its application in real life
M.A.	Literary Criticism and Theory	• Students have understood the basic functions of criticism • Students have been introduced to various critical approaches • Students have developed logical thinking

Course Outcomes of M.A/M.Sc (English):

Semester II

Class	Course title	Outcome
M.A.	English Literature from 1550-1798	• Students have understood major movements and literary figures • Students have developed literary responsibility and sense of appreciation • Students have become adept to employ innovative methods in writing

M.A.	English Literature from 1798-2000	• Students have understood major movements and literary figures • Students have developed sense of appreciation
M.A.	Contemporary Studies in English Language	• Students have understood the basic tools of language • Students have understood the different concepts of language • They have understood different perspectives of language and its application in real life
M.A.	Literary Criticism and Theory	• Students have understood the basic functions of criticism • Students have been introduced to various critical approaches • Students have developed logical thinking

Course Outcomes of M.A/M.Sc (Subject):
Semester III

Class	Course title	Outcome
M.A.	**Indian Writing in English**	• Students have understood major movements and literary figures • Students have developed literary sensibility • Students have learnt to use language in an innovative manner • Students have developed humane values • Literary tastes of students have improved
M.A.	**ELLT**	• Can teach English at primary, secondary, and Higher secondary level • Understand various theories of language acquisition • Learned how to teach English • Acquired skills for teaching English at various levels
M.A.	**Drama**	• Students have been exposed to Elizabethan dramas • Students have developed literary sensibility • Students have developed human concern • Literary tastes of students have improved
M.A.	**American Literature**	• Students have learnt about selected texts in American literature • Students have understood the difference between old world and new world literature • Students have developed human concern for fellow beings

		• They have developed aesthetic sense for literature

Course Outcomes of M.A/M.Sc (Subject):

Semester IV

Class	Course title	Outcome
M.A.	Indian Writing in English	• Students have understood major movements and literary figures • Students have developed literary sensibility • Students have learnt to use language in an innovative manner • Students have developed humane values • Literary tastes of students have improved
M.A.	ELLT	• Can teach English at primary, secondary, and Higher secondary level • Understand various theories of language acquisition • Learned how to teach English • Acquired skills for teaching English at various levels
M.A.	Drama	• Students have been exposed to Elizabethan dramas • Students have developed literary sensibility • Students have developed human concern • Literary tastes of students have improved
M.A.	American Literature	• Students have learnt about selected texts in American literature • Students have understood the difference between old world and new world literature • Students have developed human concern for fellow beings • They have developed aesthetic sense for literature

Department of Political Science

Program outcome : B.A./B.Sc./B.Com/B.Voc. (Political Science)	
1.	• To develop academic proficiency in the sub fields of Indian government and Politics, Comparative government, International Relations. Public Administration, Political Theory and Political Ideology.
2.	• To develop and be able to demonstrate skills in conducting as well as presenting research in political science
3.	• To analyze political and policy problems and formulate policy options.
4.	• Students enable to discuss the major theories and concepts of political science and its • subfields, and also deliver thoughtful and well articulated presentations of research findings.

Program outcome : M.A./M.Sc./M.Com. (Political Science)	
1.	• Post Graduate Course in Political Science seeks to offer students advance knowledge of political concepts and practices in a manner that enables students to relate them to the contemporary local, national and international event.
2.	• It seeks to emphasize both the knowledge and skill element by exposing students to new ideas not only by classroom teaching, but by also engaging in continuous experiential learning through field visits, seminars, discussions etc.
3.	• Understanding of the institutions, processes, constitutional background, and policy outcomes of Indian government and the ability to compare Indian government to other countries around the world.
4.	• Understanding of the institutions, processes, constitutional background, and policy outcomes of Indian government and the ability to compare Indian government to other
5.	• Knowledge of key theories and concepts, historical developments, organizations, and modern issues in international relations.
6.	• Understanding of government institutions, electoral processes, and policies in a variety of countries around the world and the ability to compare the effectiveness or impact of differing political arrangements across countries.
7.	• Knowledge of some of the philosophical underpinnings of modern politics and government and the legal principles by which political disputes are often settled.
8.	• Ability to use the comparative case study method of analysis, quantitative forms of analysis, and legal analysis in oral communication and in written research.

Program Specific outcome : B.A./B.Sc./B.Com/B.Voc. (Political Science)	
1.	Serve as a politician
2.	Work as a teacher in colleges, schools and high schools
3.	Serve as political party member, political adviser, and well citizen of India.
4.	Work in elections and political as well as administrative system.

5.	Serve in forest department as forest conservator.
6.	Can admit to MA Politics, LLB, MSW, MBA,
7.	Work in NGOs.
8.	Can Prepare for Competitive exams.

Program Specific outcome : M.A./M.Sc./M.Com. (Political Science)	
1.	As a Public Administrator, MA Political Science graduates can utilize their knowledge to inform policy decisions and administer those decisions effectively.
2.	Those who choose to pursue further education can in turn become lecturers and professors.
3.	A political archivist is responsible for assessing, collecting, processing, organizing, maintaining and preserving important records which possess long term value.
4.	A political correspondent is responsible for relaying important political events primarily for news channels.
5.	A Political content writer's job is to write about various contemporary and historical political issues majorly for online media outlets for news and information.
6.	A political consultant is a professional who helps an organization make politically informed choices. Their knowledge about political philosophy comes in handy in such roles.
7.	MA in Political Science helps understand the broad administrative system in India, thus making them the right fit for managerial positions.
8.	Nowadays many IT and knowledge processing companies require subject matter experts for different subjects.
9.	Public Relations is also a good option as exposure to political practices also acquaints one with culture and social systems of a place and hence making them ideal for a role as Public Relations executive.
10.	Public Relations is also a good option as exposure to political practices also acquaints one with culture and social systems of a place and hence making them ideal for a role as Public Relations executive.

Course Outcomes of BA (Political Science):

Class	Course title	Outcome
FYBA	Introduction to Indian Constitutions (G-1)	• Students enable to understand the philosophy of Indian constitutions. • Students enable to identify the causes, impact of British colonial rule. • Students enable to appreciate the various phases of Indian national movement. • Students enable to create value in young youth regarding the patriotism. • Students enable to understand the various Government of

		Indian acts their provision and reforms. • Students enable to know the salient features in making of Indian constitution • Students enable to appreciate the socio-economic political factors which lead to the freedom struggle. • Students enable to appreciate the fundamental rights and duties and the directive principle of state policy • Students enable to evaluate the evolution, functioning and consequences of political parties in India. • Students enable to identify how electoral rules and procedure in India effect election outcomes. • To familiarize students with the working of the constitutions of India
SYBA	Political Theory & Concept (G-2)	• Students enable to understand the nature and scope of political theory. • Students enable to understand the significance of political theory. • Students enable to acquaint with the theories, approaches, concepts and principles of • political theory. • Students enable to appreciate the procedure of different theoretical ideas in political • theory. • Students enable to Interpret and assess information regarding a variety of political theory. • Students enable to understand the various traditional and modern theories of political • science. • Students enable to evaluate the theories of origin of the state.
SYBA	Western Political Thought (S-1)	• Examine political thought through the Classical, Renaissance, and Enlightenment periods • based on the works of Plato, Aristotle, Machiavelli, Hobbes, Locke, Rousseau, • Tocqueville, and Marx; • Compare and contrast the concepts of justice, freedom, equality, citizenship, and • sovereignty in the works of Machiavelli, Hobbes, Locke, and Rousseau; • Explain the different versions of, and importance of, the state of nature to political • thought;

		• Explain Karl Marx's worldview, with particular regard to his critique of democracy and • the modern, politically liberal state; how it came to be; and its fundamental link to • capitalism; and • Explain John Stuart Mill's theory on utilitarianism and how he applies it to society and the state.
SYBA	Political Sociology (S-2)	• Have good knowledge about main issues and topics in political sociology. • Be able to understand basic principles of the exercise of power, of the state relations with • civil society; individual and group interactions in the political realm. • Achieve practical skills of analysis of social phenomena in their political settings. • Acquire habits of socio-political information finding, sorting and critical examining. • Foster skills of public presentations and discussions.
TYBA	Modern Political Ideologies (G-3)	• Student enables to understand the role of different political Ideologies and their impact in Politics. • Students enable to understand the different streams and subtle nuances within each ideology, the change and continuities in its doctrine and its relevance to contemporary times are highlighted. • Student enables to understand the core doctrines of each of the ideologies and to make
TYBA	Public Administration (S-3)	• Students enable to demonstrate understanding of various activities of governmental • administrators that fall under the rubric of public administration to include rule-making, • ratemaking, and other regulatory activities, policy making and the delivery of services • and programs • Students enable to understand the 20th century emergence of the modern administrative • state as a result of the technological, social, economic and political pressures that have • emerged in national industrialized and developed complex, interdependent systems. • Students enable to understanding of public administration as a career field in government.
TYBA	International Politics	• Students enable to understand the evolution, scope and significance of international relations

	(S-4)	• Students enable to demonstrate an understanding of: the key historical events and also they • enable to understand contemporary international system; and the key actors which shaped • the international Politics. • Students enable to discuss the main international relations theories. • Students enable to analyze importance of International relation in process of nation • progress. • Students enable to appreciate the foreign policy their determinants features& its relevance

Course Outcomes of M.A/M.Sc (Political Science):
Semester I

Class	Course title	Outcome
MA I	PO-C1: Traditions of Political Thought	• Student enables to know major traditions of thought that have shaped political discourse • in different parts of the world over the last three millennia. • Student stresses the great diversity of social contexts and philosophical visions that have • informed the ideas of key political thinkers across epochs. • The chief outcome is Student project the history of political thought as a series of critical interconnected and open-ended conversations about the ends and means of the good life.
MA I	PO-C2 : Administrative Theory	• Student enable to understand important concepts, approaches and theories of public • administration • Student enables to equip students with understanding of the latest developments in the • field of Public Administration. • Student enables to understand and analyze broad transformations in the study of public administration in the course of changes in socio-economic and political life.
MA I	PO-C3 : Political Institutions in India	• Students enable to introduce the leading institutions of the Indian political system and to • the changing nature of these institutions. Apart from explaining the structure and • functions of the main institutions. • Student enable to understanding the institutional balance

		of power as discussed in the • Indian constitution and as developed during the functioning of Indian democracy over the past decades.
MA I	PO-O1 : Modern Political Ideologies	• Student enables to understand the difference between ideology and thought as well as • between theory and ideology. • Students enable to understand the relationship between ideas and politics. • Student enables to understand the core doctrines of each of the ideologies and to make sense of politics through different ideological perspectives.

Course Outcomes of M.A/M.Sc (Political Science):
Semester II

Class	Course title	Outcome
MA I	PO-C4 : Comparative Political Analysis	• The purpose of this course is to acquaint the students with the sub-discipline of Comparative Politics with the following outcomes. • Students enable to understand the trajectory of the sub-discipline. • Student enable to understand the significance of the comparative methodology • Student enables to understand the dynamics of domestic politics across the countries.
MA I	PO – C5: Theory of International Politics	• Students enable to introduces the evolution and important of various theories. • Students know a brief history of international politics. • They understanding what are happening in the world and the levels of analysis. Competing theories are presented.
MA I	PO-C6 : Public policy	• Student enables to understand basic concepts, theories and process of public policy. • Student enables to understand policy processes and actors involved in it by studying specific policies. • Student enables to understand and analyze policy making in practical context.
MA I	PO-08: Political Thought in Modern Maharashtra	• Student knows the key ideas of political thinking in modern Maharashtra since the late 19th century. • Student enable to understand and decipher the diverse and often contesting ways in which • ideas of nationalism, democracy and social transformation were discussed by leading • Maharashtra thinkers.

		• To acquaint students with the main issues and concern in the public life of a regional society as it shaped in the context of colonialism and modernity. • To help students understand the essentially collective and yet diverse nature of Political Thought.

Course Outcomes of M.A/M.Sc (Political Science):
Semester III

Class	Course title	Outcome
MA II	PO-C7: Political Thinking in Modern India	• Student knows the key ideas of political thinking in modern India as it shaped in the • colonial context. • Student enable to understand and decipher the diverse and often contesting ways in which • ideas of nationalism, democracy and social transformation were discussed by leading • Indian thinkers.
MA II	PO-C8: Political Sociology	• Student enables to introduce the overall scope of the sub-discipline of political sociology. • Student enables to know power of political Sociology. • Students enable to understand different forms of justifications of power and the role of • ideology in this regard. • They studied as a repository of power in society while class and patriarchy are two • instances of how the nature of power is shaped by social factors.
MA II	PO - C9: Theory of International Relations	• Students enable to introduces the evolution and important of various theories. • Students know a brief history of international politics. • They understanding what are happening in the world and the levels of analysis Competing theories are presented.
MA II	PO-O10: Indian Administration	• Student knows the key dimensions of Indian Administration functioning at different • levels. • Students understand and analyze the administrative reforms introduced recently to make administration people-centric and to what exergualhas been realized.

Course Outcomes of M.A/M.Sc (Political Science):
Semester IV

Class	Course title	Outcome
MA II	Traditions of Political Thought	• Student enables to know major traditions of thought that have shaped political discourse • in different parts of the world over the last three millennia. • Student stresses the great diversity of social contexts and philosophical visions that have • informed the ideas of key political thinkers across epochs. • The chief outcome is Student project the history of political thought as a series of critical, • interconnected and open-ended conversations about the ends and means of the good life.
MA II	Political Process in India	• Student knows how to introduce the key issues and details of the political process in post independence India. • Students enable to understand and analyze Indian politics. • student understand the expansive meaning of political process as it shapes in the arena of electoral and party politics, in the form of mass mobilizations and as politics of interests.
MA II	Political Participation	• Student knows Political socialization is the process that shapes the durable set of attitudes and beliefs which affect nature and extent of participation. • Student knows Public opinion also shapes political activity. • Students are going beyond the study of routine participation. • Student understand the relevance of collective action in the form of social movements
MA II	Party System in India	• Student understands the nature of party system in India. • Student understands the functioning of main political parties operating in the system. • Student focused on analytical perspectives on party politics in India

Department of Economics

- **Program Outcome:**

Program Outcomes of all the programs are identified at the National Level by the concerned accrediting agency. Before this process, the college inculcates certain qualities among the stakeholders. The Programme outcomes help the stakeholders to manage the resources effectively to the maximum extent.

For every degree program of Economics, specific outcomes are previously defined by the College. This enables the stakeholders to identify and analyze complex problems. They also learn to design solutions for problems that meet the specified needs with appropriate consideration for the cultural, societal and environmental well being. The students learn to use research based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions. This is followed by modern tool usage, which they select and apply with an understanding of the limitations.

The students apply reasoning and understand the impact of the solutions in societal and environmental context. They learn to apply ethical principles and become committed to professional ethics and their responsibilities. They realize that individual and team work function effectively in multidisciplinary settings. They learn to communicate effectively with society and they are able to comprehend and write effective reports and design documentation. They also make effective presentations and give and receive clear instructions. They understand the importance of critical thinking, social interaction, effective citizenship, ethics and environment and sustainability. Ultimately, they acquire the ability to engage in independent and life-long learning.

The students understand the nature and basic concepts of Economics. They analyze the relationship between human beings and subject. Based on these outcomes, the students learn goal-setting, problem solving techniques and decision making. The college evaluates the students as Class Toppers, University Rank Holders and Best Outgoing Students. They are recognized and awarded during the Annual Day function by giving them Certificates and Mementos. Gold Medals are awarded to the University First Rank holders and Silver Medals to the remaining rank holders.

- **Course Outcome:**

Class	Course	Course Outcomes
FYBA	**Indian Economic Environment**	• Students will be familiarized about background of Indian economic environment • Ability to compare the India economic environment with international economic environment will be genrated • Students will be awared about the banking system • Students will get a primary introduction of different sector of Indian economy such as agri, industry and service. • Awareness about digital economy will be generated and they will be ready for the digital India
SYBA	**Modern Banking, G-2**	• awareness among students about evolving and modern nature of banking system will b created • Students will be introduced with role of RBI in the Indian economy. • Nature and function of cooperative and rural banking will be understood by students. • Clear understanding of financial market with respects to Indian and international context.
SYBA	**Micro Economics, S-1**	• Students will be able to understand the behavior of different economic agents, markets, consumers and price fluctuations. • Understanding of different cost and revenue concepts will be given to students. • To understand linearity and non linearity of micro economic variables. • Knowledge of different welfare concepts and there importance into social context will be imparted into students through this course. •
SYBA	**Macro Economics, S-2**	• Understanding of macro economics and its different components. • Critical analysis of study different ideological schools and their theories of macro economical development. • Understanding of Saving and investment functions will be injected into their knowledge • Different theories related to money will be studied by students. • Understanding different policies in macro terms
T.Y.B.A.	**Economic Development & Planning (G3)**	• Introduction of the concept like indicators of growth & development • Students will study different development theories • Students will study study different growth modeless

		• Importance of economic Planning,& importance of foreign capital will be studied by students.
	International Economics (S3)	• Understanding nature scope & Importance of international Economics • Understanding of theories of international trade • Understanding the role of international financial Institutions • Importance of foreign capital into the economy will be studied by students
	Public Finance (S4)	• Understanding of the role of government in economy • Various expenditure & revenue process in the public finance will be analyzed • Information of fiscal policy in public finance and its importance will enhance students macro level thinking Study of the theories of social welfare
F.Y.B.Com (sem-I & II)	**Business Economics(Micro)**	• Meaning, nature & scope of business economics will be given to all students. • Understanding of basic concept of micro economics • Students will learn to analyze demand & supply its determinants • Analysis of market structure & pricing under the same • Remunerative structure of different factors of production will be studied.
	Fundamentals of Banking	• Learning the evaluation of banking • Students will be awaked about the process of bank account opening • Types of bank accounts and their opening procedure will be studied by students • Methods of remittance will be learned and process of credit creation & its limitations will be understood. • Nature, importance and functioning of E-banking will generate awareness about the digital India into students
	3 Co-Operation	• Principle objective, nature & scope of co-operation would generate informative knowledge into students. • Study of eminent supporters & their contribution in co-operative movements • Critical thinking over the current scenario of co-operative movement in India • Impact of LPG's on co-operative movement wll be understood by students.
S.Y.B.com		**Business Economics(Macro)** • Information over Meaning nature & scope of macro economics. • Students will learn to calculate National income & its

		importance. • Use of money its functions and value of its value • Analysis of trade cycles and their occurrence after certain specified period will be studied by students. • Learning the evolution of different Employment theories. • Information Public finance and its policy approached will be given to students
S.Y.B.com	**Banking & Finance (Indian banking system)**	• Students will get the structure of Indian banking system. • Private banks- Indian & Foreign and their working system will be studied by students • To study of Indian large public sector commercial bank-state bank of India. • Reserve bank of India & its Role will be analyzed by students. • By the end of this course students will get adequate information about Indian Co-Operative credit system.
S.Y.B.com	**Co-Operation & Rural Development-I**	• Co-operative legislation in India will be studied by students. • Study of co-operative societies Act-1904,1912,& 1925 their objectives & features will be improve students information about the cooperative movement. • Study of multi state co-operative societies Act • To study of Maharashtra state co-operative societies Act-1960 • Functions progress and problems of Co-operatives. • Understating globalization and rural development
S.Y.B.com	**Agriculture and Industrial Economics:**	• The students are able to understand the Indian agricultural Problems and Prospects • The students are understand the Current Issues of Indian Agriculture • The students acquaint the role of NABARD and other financial institutions • The students are able to familiarize with Land reforms
T.Y.B.Com	**Indian & Global Economic Development**	• Basic characteristics of Indian economy as an emerging economy will be discussed by students in the class • Place and role of Agriculture & Industries sector in Indian economy will improve their knowledge about the Indian economy • Critical analysis of the reforms like liberalization ,privatization globalization & there challenges • Study of foreign capital & balance of Payment will enlace

		students' knowledge about the international economics.
T.Y.B.Com	**Banking & Finance-II**	• Students will understand the nature of financial system of India • Students will be able to understand the types of money and capital market • Students will be able to understand the nature and scope of NBFC and other institutions
T.Y.B.Com	**Banking & Finance-III (Banking law & Practices)**	• Study of banking regulations Act-1949 • Study of negotiable instrument Act-1881 • Analysis of the relationship between customer and banker • Information of project appraisal will be given.
	Co-operation and rural development-II	• Understanding the meaning, nature, scope and principle of cooperative management. • Information of human resource management in co operative sector • Co-operative administration and cooperative management as well as financial management will be understood by students. • Understanding of power and duties of auditor.
	Co-operation and rural development-III	• To understanding the structure of market as well as consumer cooperative societies. • Study of the price support system provided by the government such as MSP • marketing strategy and research system • To understand the structure of different marketing agencies funded by government ex. NAFED, APMC • Deep understand of agricultural produce market committee act of 1963
	Agriculture and Industrial Economics: II & III	• The students are able to understand the Indian agricultural Problems and Prospects • The students are understand the Current Issues of Indian Agriculture • The students acquaint the role of NABARD and other financial institutions • The students are able to familiarize with Land reforms

Course Outcome: M.A (Economics)	
Course	**Output**
Micro Economic Analysis	On Successful Completion of the Course • The students are able to understand the Problems of Basic

	Economic Problems • The students are accompanied with to retrieve the relation between different variables through various laws like Law of Demand, Law of Supply • The students will understand the Indifference curves, Elasticity of Demand and Their Types • The students are able understand the relation between various variables through law of Variable to Proportion and Law of Returns to Scale • The Students are able to understand Market structure • Social welfare and welfare economics inculcate the values among the students
Public Economic	On Successful Completion of the Course • Through this subject the students are able to understand the role of government in economic activities • The students are able to understand the difference between Public goods, Private goods as well as their benefits • The students are acquaint with various theories and Models of Public economics • The students are become familiarizes with theories of Public Expenditure • The students are able to understand the concepts of Budget and deficit Finance • The students are acquaint with the Public debt of India
International Trade and Finance	On Successful Completion of the Course • On successful completion of this course the student are enabled with the Knowledge in Classical and Modern Theories of International Trade • After the successful completion of the course the student should have a thorough knowledge on the Gains from International Trade & Concepts of Terms of Trade other allied aspects. • On successful completion of this course, the student should be well versed in the concepts, tools and principles in the field of International Economics. • On successful completion of this subject the students have the ability to understand the functions of WTO,GATT & other institutions
Agricultural Economics	On Successful Completion of the Course • The students will understand the Agricultural Economics and their terms as well as various theories. • The students will acquaint with Present Agricultural Scenario of Indian Economy • The students will be understood the Problems of farmers and Agricultural Sector • The will know the causes and impacts of various government schemes

	on agricultural Productivity • The students will become familiarize with Agricultural Challenges and Barriers
Macro Economic Analysis	On Successful Completion of the Course • The students of Macro Economics will understand the Concepts of GNP, GDP, NNP, NDP etc. • The students are able to understand the theories of National Income • The students are able to understand the Macroeconomics not only a scientific method of Analysis, but also a body of empirical economic Knowledge • The students will understand the various concepts of Output and Employment opportunities
Growth and Development	On Successful Completion of the Course • The students are able to understand Concepts of Growth and Development • The students are able to familiarizes with theories of Economics growth and development • The students are able to understand the Human Development Index and Others • The students are able to Understand Problems of Population and Measures • The students are able to understand the Income distribution among the People
Modern Banking	On Successful Completion of the Course • The students are able to the Nature , structure and role of Financial system in Economic Development • The students are acquaint with the functions of Indian Banking system • The students are able to Understand the Role of NBFC and other Financial Institutions in Indian Banking system • The students are become familiarize with Cooperative and Foreign banks and their importance in Banking system • The students are know the role and functions of IMF,WTO, UNCTAD, World Bank
Demography	On Successful Completion of the Course • The students are able to understand Nature, Scope and relation between development and population • The student will be Understand the various theories of population. • The student will be Learn about Structure and characteristics of Indian population. • The students are able to an analysis of Indian population policy.
Course	**Outcome M. Com**
Industrial	On Successful Completion of the Course • The students will be Understand the basic concepts of industrial

Economics and Environment	economics. • The students are familiarizing with new economic Policy and its impact. • The students are able to understand the theories of Industrial locations. • The buildup knowledge about industrial productivity and efficiency. • The students will understand about industrial finance and Industrial growth of India • The students will be understand the concepts of MNC's, SEZ & FDI

Course Outcomes of M.Phil Program (Economics):

Course title	Outcome
Research Methodology and quantitative Technique I	• The students to use the Techniques of statistical Analysis • To understand and analyze economics problems • Students will understand economic concepts with the help of statistics. • To understand the concepts of research design • Able to understand Methods of correlation. • Students will be initiated into various economic concepts. • Able to understand latest theoretical developments for empirical analysis. • Understand contents of report writing. • Able to understand concepts of hypothesis testing methods. • Researcher will be able to carry out a small research project in their areas of research interest independently.

Course Outcomes of M.Phil (Economics):

Course title	Outcome
Advanced Economic Theory II	• Students are able to latest theoretical development for empirical analysis. • Able to understand the basic principles of microeconomic theory. • To prepare the students to think like economists. • Able to understand contents of Assignments. • The students will gain an understanding of micro or macroeconomics challenges and advanced policy management in develop country. • Able to understand content of report writing.
Modern Indian Economy III	• Student aware of recent development in Indian economy and suggest research topic on current trend in Indian economy. • Students able to understand the changes of Indian economy • The course enables the student to apply the theoretical knowledge in the actual working of Indian economy. • Explore the economic foundation for public policy analysis related to agricultural issues. • The students will attain the ability for objective reasoning about current

	issues in Indian economy**.**

- **Program Specific outcome: B.A. (Subject)**

On successful completion of **B.A. Course (Economics)** the students are able to:

1. Understand the basic Concepts and theories of Economics
2. The students are able to analyze the Economic behavior in Practice
3. The students are able to develop Economic way of thinking
4. The ability of students enhances about the historical and Current Events of Economy
5. The ability of students to write clearly expressing an Economic Point of View
6. The students are able to tackle their Personal Economic Problems through the entire course.
7. The students are able to suggest various measures on Economic Problems

- **Program Specific outcome: M.A. (Economics)**

On successful completion of **M.A. Course (Economics)** the students are able to:

1. The students will be acquaint with unique opportunity of obtaining a professional qualification in Economics
2. The students are able to analyze the economic behavior in Practice
3. The ability of writing a clear expression of Students from Economic point of view.
4. The skill of students enhances about understanding the Various economic Problems of the country
5. The students are able to enhance the ability of comprehensive understanding of Interdisciplinary issues and aspects of society
6. The students from Economics able to explain the role of Govt. policies in Economic development
7. The student are able to predict the impact of Fiscal and Monetary Policy on Overall Economic Performance
8. The students are able to explain the Economic Problems very well.
9. The students Are able to discuss cost and causes of Unemployment and Assess the public policies
10. Students are able to formulate informed opinion on Policy issues

Department of Psychology

Program outcome : B.A. (Psychology)	
1.	Develop an understanding of the basic concepts in Psychology.
2.	Understand various psychological disorders, classify them and know the treatment.
3.	Know characteristic features of the human developmental stages.
4.	To develop a sense of responsibility of one's own actions as a part of society at large.
5.	Help the youth to make better adjustment in life and inculcating the same in the members of society.
6.	Develop listening skills and empathy with others.

Program outcome : M.A. (Psychology)	
1.	Develop self-awareness among them to discover themselves that further evolves in higher human consciousness.
2.	Form healthy interaction between society, culture and higher education in the context of psychological well-being.
3.	Develop listening skills and empathy with others.
4.	Develop professional skills that empower the students to gain employment.
5.	Contribute towards the well-being of other individuals and small groups, and promote harmony in the society.
6.	Inculcate and demonstrate skills of a counsellor that help sort issues among members of the society.
7.	Create awareness in the society towards psychological well-being

Program Specific outcome : B.A. (Psychology)	
1.	Gain the knowledge of psychological concepts through theory and practical.
2.	To explain the developmental milestones of humans.
3.	Identify and classify the psychological disorders.
4.	Determine the level of mental disorder and suggest treatment.
5.	Develop healthy relations with the people in the society.
6.	Develop a sense of scientific inquiry in the psychological problem and develop research design.
7.	Administer psychological tests and interpret results.
8.	Conduct experiments under controlled conditions to test a psychological phenomenon or theory.

Program Specific outcome : M.A. (Psychology)	
1.	Understand the functioning of the brain and its role in maintaining good mental health.
2.	Administer psychological tests and measure the abilities, aptitude, mental state of the individual and interpret the results.
3.	Apply basic statistical techniques to analyse data in research.

4.	Know the procedure of test construction and standardization.
5.	Apply principles of learning and memory for better understanding of study material.
6.	Know the applications of psychological tests in various fields such as clinical, industrial and counselling.
7.	Formulate problem, hypothesis and determine adequate research design.
8.	Conduct and design experiments to test psychological phenomenon and theories.
9.	Assess one's own personality and work towards personality development.
10.	Diagnose psychological disorders, classify and suggest treatment.
11.	Determine the therapy required to treat a disorder.
12.	Conduct independent small-scale research on psychological issues pertaining to the individual and society at large.
13.	Assess human motivation and emotion.
14.	Undertake case studies related to psychological disturbances and suggest therapies for the same.

Course Outcomes of BA (Psychology):

Class	Course title	Outcome
FYBA	General Psychology	• Describes the basic principles of psychology. • Differentiates the historical trends in psychology and the theoretical perspectives. • Solves personal day to day problems related to him on his own. • Applies the principles learnt in perception, learning and memory.
SYBA	Social Psychology	• Understands the basic concepts, theories and applications of Social • Psychology. • Mingles in a healthy manner in groups. • Develops healthy close relationships with peers and others in the society. • Displays pro social behavior in society.
SYBA	Abnormal Psychology	• Classifies the disorders as per the recent classification of abnormality. • Describes the causes, symptoms and treatments of various types of psychological disorders. • Differentiates the psychological disorders.
SYBA	Developmental Psychology	• Knows the basic concepts of human development processes. • Understands the influences of various factors on development. • Creates awareness among people about role of both parents in genetic make-up of the offspring. • Spreads the importance of factors responsible for normal healthy development of a child.
TYBA	Industrial and Organization	• Describes the emergence of Industrial and Organizational Psychology. • Understands the work done in Industrial and Organizational

	al Psychology	Sector. • Becomes aware of the significance of training, performance appraisal, leadership models. • Creates awareness of the importance of Engineering Psychology
TYBA	Scientific research and experimental Psychology	• Understands the basic concepts of experimental psychology and research methodology. • Asks questions related to human behavior. • Formulates researchhypotheses and identifies variables related to the research. • Applies the basic steps in scientific research, • Knows the basic information about test-administration and scoring, and interpretation of the obtained results.
TYBA	Psychology practical: test and experiments	• Applies elementary statistical techniques to analyze data. • Administers psychological tests, scores and interprets the results. • Conducts basic psychological experiments, • Undertakes an independent small-scale research project.

Course Outcomes of M.A. (Psychology):

Semester I

Class	Course title	Outcome
M.A. I	Cognitive Processes	Get acquainted with the processes involved in sensation and perception Develop insight into one's own and others' behaviour and underlying mental processes. Develop understanding of major concepts, theoretical perspectives, and empirical findings in cognitive psychology
	Psychological Testing: Theory	Get acquainted with the characteristics of standardized tests. Gets familiar with psychometric theory and principles of test construction.
	Statistical Methods	Understand the different statistical methods with theiruses and interpretations, Develop computational skills. Analyze the data of practical and projectwork.
	Psychology Practical:Tests	Administer psychological tests, interpret scores and write report. Evaluate psychological tests, Acquire certain skills of psychological counselling on the basis of psychological test results.

Course Outcomes of M.A. (Psychology:

Semester II

Class	Course title	Outcome
M.A. I	Learning and Memory	Knows various types, models and theories of learning and memory

		Understand neurological basis of learning and memory. Applies the principles of learning and memory
	Psychological Testing: Applications	Understand various psychological assessment techniques Applies psychological tests in different fields.
	Research Methodology	Know the basic research concepts. Follow appropriate steps in research process. Know the basic terminology of advanced research techniques and follow the same in research reports and papers of different branches of psychology. Follow commonly used research designs and the APA style of preparing research proposal and writing research report.
	Psychology Practical: Experiments	Know the different areas of experimentation in psychology. Uses various skills of conducting experiments in psychology. Applies appropriate experimental design. Follows appropriate report writing style.

Course Outcomes of M.A.(Psychology):
Semester III

Class	Course title	Outcome
M.A.II	Personality	• Know comprehensive, rigorous and systematic treatment of centrally important theories of personality. • Observe and interpret individual differences in behaviour in the light of sound theoretical systems of personality. • Apply personality theories in different walks of life.
	Psychopathology-I	• Follow latest DSM-5 classification system of Mental Disorders. • .Understand various paradigms of Psychopathology • Understand the symptoms and prognosis of different Mental Disorders
	Psycho-diagnostics Procedure and Techniques	• Aware of various Psychodiagnostics, procedure & techniques. • Know and apply Psychodiagnostic tools to be used & skills to be acquired
	Project	• Understand proper scientific procedure for research. • Conduct an independent small-scale research,

Course Outcomes of M.A.(Psychology):

Semester IV

Class	Course title	Outcome
M.A.II	Motivation and Emotion	• Has a comprehensive overview of the major theories of motivation and emotion, • Aware of the role of biological factors in motivation and emotion. • Know the importance of positive and negative emotions in human life
	Psychopathology-II	• Aware of various Psychodiagnostics, procedure & techniques. • Acquire ware and follow different Psychodiagnostictools & skills.
	Psychotherapies	• Know various Psychotherapies and its basic procedure. • Aware of effectiveness of specific psychotherapy in solution of particular problem. • Acquire different psychotherapeutic skills.
	Practicum	• Conduct scientific case studies. . Classify disorders. • Know Prognosis. • Conduct sessions of therapy. • Write session report of each case. CO-6. Present the case in the classroom.

Department of Sociology
Course Output 2018-19

Course	Subject	Course Outcome
FYBA	Sociology G1	The students at this level will get acquainted with the basic concepts in sociology.
SYBA	Sociology	The students at this level will get acquainted with the theories, thinkers in general and social welfare and social legislations in Indian social context.
TYBA	Sociology	The students at this level will get acquainted with the theoretical knowledge of research methodology. Crime and society is another arena where students learn how crime is rooted in social backgrounds.
PG I	Sociology	The students at this level will get acquainted with the theoretical and practical knowledge of research methodology. The students learn Indian sociology and social thinkers, so that the students will be capable of analyzing social issues with sociological perspectives.
PG II	Sociology	The PG students at this level will be empowered with the knowledge of wider sociological theories and recent developments in context with social developments, Human Rights, Globalization.
BA	In Sociology	BA in course in Sociology enables students to get acquainted with sociological method and perspectives at basic level. With these students can prepare for variety of competitive exams, MA in Sociology, MSW, Law, and Journalism.
PG	In Sociology	MA in course in Sociology enables students with sociological method, skills and perspectives at advanced level. With these students can prepare for variety of competitive exams, Ph.D., M. Phil., SET, NET, JRF, MSW, Law, and Journalism.

Department of History

	Program outcome : B.A. (History)
1.	Student enables to Evaluate, analyze and synthesize historical materials (primary and secondary sources).
2.	Student enables to Recognize and explain the historical development of cultures.
3.	Student understands to Evaluate and recognize different Empire in Indian history
4.	Student Identify the role of theory and methodology in the production of historical knowledge
5.	Student Identify and critique basic historical concepts

	Program outcome : M.A. (HISTORY)
1.	Students enable to adequate conceptual base of history and better understanding of history and its forces
2.	Students enable to research in terms of form formulating hypotheses and develop broad frames of interaction with other social sciences and attain certain level of interdisciplinary approach
3.	Students understanding the social, economic and institutional bases of Ancient India.
4.	Students enable to understanding the Ancient Indian history
5.	Students enable to understand historical materials efficiently and effectively integrate and use of historical information to accomplish a specific purpose.
6.	Students understand cultural, ethical, social, legal, and economic issues history.

Program Specific outcome : B.A. (HISTORY)	
1.	A history graduate can find employment with Archaeological Survey of India or with private firms related to archaeology
2.	For History graduates, the option of public service is always open.
3.	Work as a teacher in schools and high schools
4.	Serve as conservator and tourist guide in historical monuments.
5.	NGOs and Social Welfare Organizations also employ BA History graduate
6.	Writer/Subject Matter Expert

Program Specific outcome : M.A. (HISTORY)	
1.	Jobs in Government: policy analysts, government historians, intelligence analysts, museum curators, administrative and programs specialists, communication specialists, and corporate communication managers.
2.	Travel and Tourism Expert: Work as a tourist guide at historical and religious places
3.	School Teacher: Work as a teacher in schools and high schools
4.	College Teacher: Work as a assistant professor in colleges
5.	Archivist: A history graduate can find employment with Archaeological Survey of India or with private firms related to archaeology.
6.	Researcher: Many Government and non-government institutes along with research

	center offer several career options for qualified geographers with numerous specializations
7.	Competitive Examinations: For History graduates, the option of public service and NET/SET is always open
8.	Social Work: NGOs and Social Welfare Organizations also employ BA History graduates
9.	Exhibit Designer / Content Creator
10.	Writer/Subject Matter Expert
11.	Journalist: Journalism is a common career for History graduates.

Course Outcomes of BA (HISTORY):

Class	Course title	Outcome
FYBA	(1177) Chh. Shivaji and His Times (1630 to 1707)	• Students got knowledge of concept of Shivaji and his times. • Student view increased of Nationalism and Secularism. • Students got knowledge of administration of Shivaji Maharaj. • Introduced to student social, economic and religious condition.
SYBA	(2177) Modern India (1857-1950)	• "History of Modern India" topic as a part of History is a very important section as far as the Syllabus of any competitive examination is possible, especially Civil Services exams. • Students understand of the stages of development in Modern India, why certain events happened and analysis of the consequences of such developments that paves an impact on our society, economy and our political system. • Modern Indian history Importance For competitive examination.
SYBA	(2178)- Ancient India (3000B.C. to 1260AD.)	• Ancient Indian history is very importance for UPSC Examination. • When students doing study of ancient Indian history that time they know about original culture religion and society. • Increasing student‟s wideness. • Student capable for discuss any Social issue
SYBA	(2179) - History of Modern Maharashtra (1818-1960)	• Students got knowledge of concept History of modern Maharashtra. • Modern Maharashtra history is useful to student for MPSC examination. • National and social movement in Maharashtra Introduced to students. • Student got knowledge of Maharashtra Philosophers and their philosophy

TYBA	(3177)-History of the World in 20th century	• Students got knowledge of concept in world history. • Students got global event knowledge it is use for increased intellectual level World trend of thinking, Marxist, Communalism, Dictatorship, Empearalism, Nazizum, fascism, Terrorism, Feminism, Globalization, etc introduced to Students
TYBA	(3178)- Introduction to History	• Students known source of history, • Practically student known to how much write history. • Increased the knowledge of research in history • Students know external and internal Criticism. • Students know historian works.
TYBA	(3179) History of Asia in 20th Century	• Students know history of America. • Concept of American history introduced to Students • Students know causes of Great Depression and policy of New Deal and Fear Deal. • Students know American politics in world. • Students got knowledge of international relation with America.

Course Outcomes of M.A (HISTORY):

Semester I

Class	Course title	Outcome
MA I	HS - Core Course- 1 History and its Theory	• Students got knowledge of History writing theory. • History writing trends in the world introduced to students. • Students get helped to research in terms of formulating hypotheses and develop broad frames of interaction with other social sciences and attain certain level of interdisciplinary approach
MA I	HS -Core Course- 2 Evolution of Ideas and Institutions in Ancient India	• Students understand of the social, economic and institutional bases of Ancient India. • It is based on the premise that an understand of Ancient Indian history is crucial to understand Indian history as a whole.
MA I	HS – Core Course- 3 Maratha Polity	• Students understand administrative system of the Marathas in an analytical way,to acquaint the student with the nature of Maratha Polity. • Students understood basic components of the Maratha administrative structure, to enable the student to understand the basic concepts of the Maratha polity
MA I	HS -Optional Course- 1 Cultural History of Maharashtra	• Students know relatively neglected part of social history; it is an attempt to provide voice to the history of the oppressed. • It defines and provides understand of various concepts,

		further explains the caste system and evil practices like untouched ability and its rigidification in ancient and medieval times. • Students get knowledge of it lays emphasis on the earlier forms of protest by Buddhism, Jainism and later by Bhakti movement, in the medieval period especially in Maharashtra, • Students know that, which lays the foundation for social awareness and renaissance of the per Ambedkarian period

Course Outcomes of M.A (HISORY):

Semester II

Class	Course title	Outcome
MA I	HS -Core Course- 4 History and its Practice	• To helped student interrogate existing paradigms and challenge the outdated. • To helped students in developed critique. • To helped student help research in terms of formulating hypotheses and developed broad frames of interaction with other social sciences and attain certain level of Interdisciplinary approach.
MA I	HS- Core Course- 5 Evolution of Ideas and Institutions in Medieval India	• Student introduced nature of medieval Indian society, economy, state formations, and the main religious currents of the time. • It is seen as a continuation of the course on ancient India. Students understand of the nature of society, and the problems of the challenge to that society, through colonialism, at a later stage.
MA I	HS Core Course- 6 Socio –economic History of the Maratha	• Students were the components of social structure and their functions, to understandthe relationship between religion, caste, customs, traditions, class in 17th and 18th century Maratha Society, • To enable the student to understand aspects of economic life, to trace the determinants of changes in social and economic life.
MA I	HS – Core Optional Course- 7 Marathas in 17th and 18th century Power Politics	• Students understand of the changing position of Dalit at conceptual and practical level of social transformation, from 19th century till today. • This paper also lays emphasis on Ambedkarian Movement, which marks an evolutionary phase in Dalit emancipation. • Students get knowledge of it highlights the constitutional rights for safeguarding the interests of the oppressed.

		• It takes into account Dalit literature, which provides space for understand of Dalit consciousness and adds new dimensions in understand " Dalit"

Course Outcomes of M.A (HISTORY):

Semester III

Class	Course title	Outcome
MA II	HS –Core Course- 7 Ancient and Medieval Civilization of the World	• Ancient and Medieval cultures with a view to understand the students, • Students were known reinterpret and present them in historical perspective. • Student to understand intellectual trends in the modern world to enable the student to have a better understand of Indian History in the World context.
MA II	HS- Core Course- 8 Debates in Indian History	• Students introduced the student to some of the issues that that have been debated by historians and to introduce some perspectives with reference to Indian History.
MA II	HS- Core Course – 9 Economic History of Modern India	• Student understands to structural and conceptual changes in Indian economy after coming of the British. • Students were awareness of the exploitative nature of the British rule, • Students understand the process of internalization by Indians of new economic ideas, principles and practices.
MA II	HS-Core Optional Course- 13 Maharashtra in the 19th Century	• Student knows the history of modern Maharashtra from an analytical perspective; to point out to them the dialectical relationship between continuity and change in Maharashtra. • Students understand the ideas, institutions, forces and movements that contributed to the structural changes in Maharashtra. • Students understand various interpretative perspectives. To helped them in articulating their own ideas and views leading to orientation for research. • To introduced the student to regional history within a broad national framework

Course Outcomes of M.A (HISTORY):

Semester IV

Class	Course title	Outcome
MA II	HS –Core	• Students understood the history of „Modern" India in an

	Course- 10 History of Modern India (1857 -1971)	analytical perspective. • To made them awareness of the multi-dimensionality of Modern Indian History. • Students were the dialectical relationship between continuity and change in India; to highlight the ideas, institutions, forces and movements that contributed to the shaping of the Indian modernity; to acquaint the student with various interpretative perspectives; to help them in articulating their own ideas and views leading to the research-orientation.
MA II	HS – Core Course-11 Intellectual History of the Modern West	• Students were understand the concepts that are used in history, both of west Europe and India; to acquainted the student with the intellectual activity that played an important role in shaping events; the transition from medieval to modern times.
MA II	HS Core Course-12 World after World War II (1945 – 2000)	• To acquainted the student with the post-World War II scenario and to enable them to understand contemporary world from the historical perspective.
MA II	HS Core Optional Course- 19 Maharashtra in the 20th Century	• To enabled the student to study the history of modern Maharashtra in an analytical perspective; to point out to them the dialectical relationship between continuity and change in Maharashtra. • Students were understood ideas, institutions, forces and movements that contributed to the transformation in 19th century Maharashtra. • To acquainted the student with various interpretative perspectives. • To helped them in articulating their own ideas and views leading to research orientation. • To introduced the student to the regional history within a broad national framework.

Department of Zoology

Program outcome : B.Sc. (Zoology)	
1.	Demonstrate, solve and an understanding of major concepts in all disciplines of Zoology.
2.	Solve the problem and also think methodically, independently and draw a logical conclusion.
3.	Understand the evolution, history of phylum.
4.	Create an awareness of the impact of Zoology on the environment, society, and development outside the scientific community
5.	To study and understand the classification of whole phyla includes in Non chordates with the help of charts/models/pictures.
6.	To inculcate the scientific temperament in the students and outside the scientific community.
7.	Use modern techniques, decent equipment's

Program outcome : M.Sc. (Zoology)	
1.	Student can identify and classify all Animal phylum from protozoa to Mammals, also understand the evolutionary relationship and their taxonomic aspects.
2.	Knows the concept, process, physiology, and molecular basis of animal development. Also knows the methods of cultivation & economic importance of various species, honeybees, lac insects, fruit fly, Sericulture, Vermiculture etc
3.	Students know about economically important Fishery, Poultry, Animal husbandry, Goat and sheep farming and also methods of preparation and application of Milk and milk products.
4.	Understand the application of Bio-pesticides; know about sources,
5.	In Biotechnology student gain knowledge about various techniques such as Elisa techniques, DNA sequencing, DNA finger printing techniques, Somatic cell hybridization, cloning, Human Genome project etc.
6.	Students learns the basic biostatistics, experimental statistics and bioinformatics.
7.	Students understood plant organism interaction, Animal tissue culture.
8.	To inculcates the scientific temperament in the students and outside the scientific community.

Program Specific outcome : B.Sc./ (Zoology)	
1.	Gain the knowledge of Zoology through theory and practical's.
2.	Study and understand the DNA Recombinant technology.
3.	Understand the testing of hypothesis.
4.	Use modern Zoological tools, Models, Charts and Equipment's.
5.	Know structure-activity relationship.
6.	Understand good laboratory practices and safety.

7.	Make aware and handle the sophisticated instruments/equipment.
8.	Gain the knowledge of Zoology through theory and practical's.
9.	Study and understand the DNA Recombinant technology.

Program Specific outcome : M.Sc. (Zoology)	
1.	Students acquired knowledge through practical work in fields as well as in laboratory.
2.	Project helps for creating research attitude among the post graduate students.
3.	Develop research oriented skills.
4.	Develop the application of statistical techniques in research
5.	Understanding of new techniques to understand the subject

Course Outcomes of B.Sc. (Zoology):

Class	**Course title**	**Outcome**
FYBSc (Paper-I)	Animal systematics and Diversity I and II	• Understanding of basics of Animal Classification. • Understanding of parasitology • Understanding of host and parasite relationship
FYBSc- (Paper-II)	Fundamental of Cell Biology and Genetics	• Understanding of fundamentals of cell biology • Understanding of types of cells • Understanding of cell organelles • Understanding of techniques used in cell biology study • Understanding of Mendellian genetics. • Understanding of fundamentals of genetics

Semester I

SYBSc- (Paper-I)	Animal systematics and Diversity III	• Understanding of phylum Arthropoda, Mollusca and Echinodermata with respect to habits and habitats • Understanding of morphology and anatomy of starfish • Understanding of larval forms of above mentioned phyla • Economic importance of Arthropods and molluscs
SYBSc (Paper-II)	Applied zoology I	• Understanding of application of fishery science • Understanding of science of pest control • Understanding of different pests and their infestation

Semester II

SYBSc (Paper-I)	Animal systematics and Diversity IV	• Understanding of Phylum Chordata and its classes • Understanding of general characteristics of reptiles aves and mammals. • Understanding of Scoliodon systems • Understanding of adaptations according to their habitat
SYBSc (Paper-II)	Applied zoology II	• Understanding of apiculture and sericulture • Understanding of tools and techniques used in

		apiculture and sericulture • Understanding of enemies of honey bees and silk moths

Semester III

TYBSc (Paper-I)	Animal Systematic and Diversity- V	• Understand the evolution, history of phylum. • Understand about the Non Chordate animals. • To study the external as well as internal characters of non chordates. • To study the distinguishing characters of non chordates. • Understand the economical importance of Molluscs • Understand the various internal systems like Digestive system,nervous system with the help of charts. • Understand the functions of Gemmules and spicules. • Understand the economical importance of Molluscan shells.
TYBSc (Paper-II)	Mammalian Histology	• Understand the terms Histology and Physiology • Understand the cell, tissue, organ, system and organisms. • Study the derivatives of skin- horns, nails, hairs. • Study and understand the terms- acidosis, alkalosis, asphexia, hypoxia, anoxia and cyanosis
TYBSc (Paper-III)	Biological Chemistry	• Understand about the agencies responsible for Production of various products using biochemistry. • Understand the term pH, Buffer. • Understand the structure and function of carbohydrate, amino acids, proteins, and lipids. • Understand the concept Enzymes and also Vitamins and minerals. • Understand the Principle role of Vitamins in metabolism and the deficiency diseases.
TYBSc (Paper-IV)	Enviromental Biology & Toxicology	• Know the biotic and abiotic components of ecosystem. • Food chain & food web in ecosystem. • Understand diversity among various groups of animal kingdom. • Understand Animal community & ecological adaptation in animals. • Scope , importance and management of biodiversity
TYBSc (Paper-V)	Parasitology	• To study and understand the scope and branches of Medical Zoology. • To aware the students for various parasites and diseases which spreads • in human with the help of study of host-parasite relationship.

		• To increase awareness for the health in students. • Understand the various disease causing vectors like Mosquitoes. • To aware about the typhoid, cholera likes disease.
TYBSc (Paper-VI)	Cell Biology	• Understand the Scope of cell biology, because cell is the basic unit of life. • Understand the Main distinguishing characters between plant cell and animal cell. • To study and understand the whole cell organelles with their structure and function. • Understand the cell cycle and know the importance of various cells in body of organisms. • Understand the various applications of cells by using cell biology like study of various types of tumor. • Understand the Animal cells and various cell organelles by using microphotographs. • Course
	Semester IV	
TYBSc (Paper-I)	Biological Techniques	• Understand the various Applications of Biotechnology. • Study and Understand the Hybridoma technology as well as Enzyme biotechnology. • Study and understand the DNA Recombinant technology. • Understand the industrial and environmental biotechnology. • Study and understand the Stem cell biotechnology. • Understand the Scope and Significance of Biotechnology.
TYBSc (Paper-II)	Mammalian Physiology and Endocrinology	• Understand the Importance of physiology and branches of it. • Understand the terms-Osmosis, diffusion, pH and Buffer. • Understand the Digestion and Excretion process, by studying the organs of it • Understand the process of Metabolism. • Understand the term Detoxification. • Understand the Circulatory system and Lymphatic system. • Study the nervous system.
TYBSc (Paper-III)	Genetics and Molecular Biology	• Understand the Molecular biology and molecular biology. • Understand the cell divisions and types of mutation. • Understand the structure and function of the cells.

		• Understand the term cell signaling. • Aware the students for Cancer. • Understand the Tools and Techniques in Molecular Biology. • Understand the term ELISA technique and DNA finger printing.
TYBSc (Paper-IV)	Organic Evolution	• To understand Origin of life with respect to prokyariotic and eukaryotic cells. • Understand the evidences of organic evolution by anatomical embryological list, paleontological, physiological, genetics and molecular biology evidences. • Understand theories of organic evolution, isolation, speciation. • Understand geological time scale, methods and classification of animal distribution and factors affecting animal distribution.
TYBSc (Paper-V)	General Embryology	• Understand the terms: Gametogenesis, Fertilization and early development. • Understand the Morphogenesis and Organogenesis in animals. • Understand the Aging, Apoptosis and Senescence.
TYBSc (Paper-VI)	Medical Entomology	• Understand the fundamentals of agricultural, forest, medical and veterinary entomology. • Understand, Morphology and Anatomy of Insects. • Understand intra specific and inter specific relationships among insects. • To understand significance of beneficial and harmful insects with reference to their habit and habitat, life cycle, diseases caused by them and their control measures.

Course Outcomes of M.Sc. (Zoology):

Semester I

Class	Course title	Outcome
M.Sc. 1st year	Biochemistry-I	• Understanding different biomolecules and its role in metabolic activity • Understanding of protein structure its classification and role • Understanding of enzyme classification, working of enzymes and factors affecting enzymes
M.Sc. 1st year	Cell Biology	• Understanding of shapes, sizes and types of cells • Understanding of different organelles

		• Understanding of assembly and function of cytoskeleton. • Understanding of cell cycle and its check points • Understanding of vesicular and protein trafficking.
M.Sc. 1st year	Genetics	• Understanding of Mendelian genetics and its practical application. • Understanding of gene, linkages, inheritance and traits • Understanding of population genetics • Understanding of somatic cells genetics and human genetics.
M.Sc. 1st year	Biostatistics	• Understanding of application and uses of statistics in biology • Understanding of different concepts and principles of statistics • Analysis of collected data in statistical formulations
M.Sc. 1st year	Skills in Scientific communication and writing	• Understanding of language as communication tool and organization of English language • Understanding of errors in written and spoken presentations • Understanding of hypothesis theory and concept • Understanding of science paper and project preparation. • Understanding of critical analysis of ideas and evidences and collected data. • Understanding of summery, abstract and title designing.
M.Sc. 1st year	Fresh Water Zoology	• Understanding of habitats for aquatic environments. • Understanding of physical and chemical conditions required for aquatic life. • Understanding of protective adaptation of protozoans, rotifers, crustaceans and fishes. • Understanding of respiratory and locomotory adaptations in fresh water insect and larvae. • Understanding of effect of water poolution on aquatic life.

Course Outcomes of M.Sc (Zoology):

Semester II

Class	Course title	Outcome
M.Sc. 1st year	Biochemistry-II	• Understanding of thermodynamics and energy concept • Understanding of metabolism and related pathways. • Understanding of lipid, carbohydrate, protein pathways and ATP synthesis.
M.Sc. 1st year	Molecular Biology	• Understanding of structure topology and physic chemical properties of DNA.

		• Understanding of genome organization. • Understanding of DNA replication in prokaryotic and eukaryotic organisms. • Understanding of DNA damage and repair. • Understanding of central dogma of life.
M.Sc. 1st year	Developmental Biology	• Understanding of developmental biology of model animals like fish, frog, chick, mouse and drosophila. • Understanding the concept of oogenesis, gametogenesis and fertilization. • Understanding of pattern formation during developmental stages of frog and drosophila. • Understanding the differentiation of cell and post embryonic development.
M.Sc. 1st year	Endocrinology	• Understanding of role of hormones • Understanding the mechanism of hormone action and signal transduction cascade. • Understanding of hormonal regulation, calcium and phosphate metabolism. • Understanding of role of hormonal system in regulation.
M.Sc. 1st year	Comparative Animal Physiology	• Understanding of animal physiology • Understanding of respiratory system and oxygen transport. • Understanding of working of muscle movements and role of cytoskeleton. • Understanding of osmotic regulation, temperature regulation and chemical communication.
M.Sc. 1st year	Biochemical techniques	• Understanding of chromatography techniques • Understanding of electrophoresis, absorption spectrophotometer, radioactivity and centrifugation techniques.

Course Outcomes of M.Sc. (Zoology):

Semester III

Class	Course title	Outcome
M.Sc. 2nd year	Entomology I	• To understand the origin, evolution and inter relationship of insects with other arthropods. • To understand classification and phylogeny of Apterygotes, Exopterygote and Endopterygote insects. • To understand the comparative and histological studies of systems such as digestive, respiratory, nervous, circulatory, excretory and reproductive system. • To understand Integument and its derivatives.

		• Understand the Studies of the following systems: The Sense organs, Endocrine glands and Exocrine glands. • To understand Light and sound producing organ.
M.Sc. 2nd year	Immunology	• Understanding of Immune system • Understanding of immunogenic cells • Understanding of disease detection by body • Understanding the concept of antigen antibody interaction, antigen antibody synthesis and antibody diversity.
M.Sc. 2nd year	Genetic Toxicology	• Understanding of toxicology comcept. • Understanding of types of mutations. • Understanding of toxic effects of mutations on animals. • Understanding of detection methods of mutations.
M.Sc. 2nd year	Insect physiology and Biochemistry	• To understands Integument: Structure, Chemistry, sclerotization, functions. • To understand Digestion and absorption of proteins, carbohydrates and lipids. • To understand Fat body: Structure, physiology, biochemistry, functions. Integration of carbohydrate, fat and acid metabolism • Ventilatory mechanisms and their control. • Haemolymph: Physico-chemical characteristics of plasma: types and structure of haemocytes, functions. • Muscle: structure, physiology and biochemistry of flight muscles. • Excretion and water balance: Structure and function of malphigian tubules. Water balance and nitrogen excretion. • Microsomal and extramicrosomal enzymes insecticide • degradation and detoxification.
M.Sc. 2nd year	**Parasitology**	• To understand the Study of life cycle, role as vector & control measures of Ticks, Mosquito - anyone from- Anopheles/ Aedes/ Culex • To understand the Preadaptation to infectiousness, Myasis: Classification according to tissue, vectors specific, sub specific, accidental; clinical presentation humans, syndrome, symptoms, diagnostic, control method prevention, treatment; Transmission, Parasitoidal etc. • To understand the Manipulation of Host behavior, Parasitism & Altruism, parasites & social behavior of hosts, parasitism & life history, parasitic effects benefiting the host.

		• To understand the classification, geographical distribution, morphology, life-cycle, transmission, pathogenecity, treatment and prophylaxis of: Protozoa, Platyhelminthes, Nematoda. • To understand the Genetics & Molecular Biology of • Trypanosoma, Plasmodium, Resistance of Malaria to drugs, its mechanism & assessment. Platyhelminthes and Nematodes. • To understand the Serology & immunodiagnostic • Immunodiagnostic assays, Immunodiffusion, Indirect • haemogglutination test.
M.Sc. 2nd year	Insect Ecology	• Understanding about the History of ecology & Entomology Ecological associations, Insect and humans, Insect and Climate, Temperature Photoperiod Rainfall, Wind, Climate change, Insect Herbivores. • To understand the Feeding strategies of herbivorous insects, Plant defenses and Natural enemies and insect population dynamics. • To know the variety of Natural enemies & Impact of enemies on insect populations. • Understanding the Concept of niche & competition among insects, Insects in ecosystems, Fundamentals of ecosystem ecology Leaf shredding insects, Insect defoliators & cycling of nutrients insect, plant community: structure and successor. • To understand the Insect conservation methods, Threats to insects conservation and restoration, Prospects for insect conservation.

Course Outcomes of M.Sc. (Zoology):

Semester IV

Class	Course title	Outcome
M.Sc. 2nd year	Entomology II	• Gametogenesis: Spermatogenesis, Oogenesis, Seminal transfer, Fertilization and oviposition. • Insect early embryonic development: Cleavage and Blastoderm formation, Germ band, Gastrulation, Blastokinesis, differentiation of germ layers, • Segmentation, Appendages formation and organogenesis in brief. • The post embryonic development; Eclosion from the egg. The developmental stages: larva, Pupa, Nymph, Emergence from the pupa/cocoon. Metamorphosis and Growth. Hadron's experiments with imaginal disc,

		Regeneration and Aging. • Diapause: Occurrence, Initiation and Preparations for diapauses, Diapause development and Controls.
M.Sc. 2nd year	Economic Zoology	• To understands Parasitic protozoans and their role in human welfare, soil protozoans and their role in agriculture. • To understands Sponge culture and its importance in industry. • Understand Concept of Coral reef and its significance. • Understand Helminths as human and animal parasites. • Understand Nematodes- parasitic roundworms of animals and plants And Vermiculture industry in India. • Understand the Household insects, Apiculture, Lac culture, Sericulture, Prawn culture, Insects of commercial value and stored grain pests.
M.Sc. 2nd year	Mammalian Reproductive Physiology	• To understand Reproductive organ: male and female gonads, duct systems and sex accessories, external sexual dimorphisms. • Understand the Reproductive patterns: Environmental factors and breeding, continuous and seasonal breeders. • Understand the Sexual cycles: puberty, oestrous and menstrual cycles. Ovarian event: follicular phase, cycling of non-pregnant uterus and vagina. • To understands Pregnancy: conception and blastocyst formation, implantation and delayed implantation, placenta: formation, types and functions, hormones in pregnancy.
M.Sc. 2nd year	Histology and Histochemistry	• Understanding of fundamentals of histology • Understanding of tissue system. • Understanding of different tools and techniques used in histology • Understanding the detection of macromolecules
M.Sc. 2nd year	Pollution Biology	• To understands the Biosphere: Introduction, hydrosphere lithosphere, atmosphere. • To understand Pollution: Kinds of pollution and pollutants (Air, Water, and Agricultural). • To understands Noise pollution: Characteristics of sound, source and effects of noise pollution. • To understand Pesticide pollution: Pesticides and their kinds, possible sources and pathways of pesticide Pollution. Impact of pesticides on living organisms.

Department of BOTANY

Program outcome :B.Sc. (Botany)	
Department of Botany	After successful completion of three year degree program in Botany a student is able to-
Programme outcomes	PO-1. Students know about different types of lower & higher plants their evolution in from algae to angiosperm & also their economic and ecological importance. PO-2. Cell biology gives knowledge about cell organelles & their functions PO-3. Molecular biology gives knowledge about chemical properties of nucleic acid and their role in living systems. PO-4. Genetics provides knowledge about laws of inheritance, various genetic interactions, chromosomal abrasions & multiple alleles. PO-5. Structural changes in chromosomes. PO-6.Student can describe morphological & reproductive characters of plant and also identified different plant families and classification. PO-7.They knows economic importance of various plant products & artificial methods of plant propagation PO-8. Use modern Botanical techniques and decent equipments. PO-9.To inculcates the scientific temperament in the students and outside the scientific community PO-10 Industrial Botany: By studying this course students can apply this knowledge in various industries such as Mushroom cultivation, biofertilizer production, biopesticide, etc. They can also set up their own industries.

Program outcome :M.Sc. (Botany)	
1.	PO-1. . Student can identify and classify all plant groups from algae to angiosperms, also understand the evolutionary relationship and their taxonomic aspects. PO-2. Knows the concept, process, physiology, and molecular basis of plant development. Also knows the methods of cultivation & economic importance of various species, millets, leguminous plants, fruits, essential oils, vegetables etc. PO-3. Students know about economically important algae, their cultivation and applications. and also methods of preparation and application of algal products. PO-4. Understand the application of Biopesticides; know about sources, methods and production of biofuel. PO-5. Acquired knowledge of fermentation technology and production of fermented products. PO-6.In seed technology student gain knowledge about seed structure

	development, chemical composition, seed production, processing, seed testing, quality control, seed certification and new hybrid variety. PO-7.Students learn the basic biostatistics, experimental statistics and bioinformatics. PO-8. Students understood plant organism interaction, PO-9.To inculcates the scientific temperament in the students and outside the scientific community

Program Specific outcome: B.Sc. (Botany)	
1.	PSO-1. Students acquire fundamental Botanical knowledge through theory and practical's. PSO-2. To explain basis plant of life, reproduction and their survival in nature. PSO-3. Helped to understand role of living and fossil plants in our life. PSO-4. Understand good laboratory practices and safety. PSO-5 To create awareness about cultivation, conservation and sustainable utilization of biodiversity. PSO-6. To know advance techniques in plant sciences like tissue culture, Phytoremediation, plant disease management, formulation of new herbal drugs etc. PSO-7 Students able to start nursery, mushroom cultivation, biofertilizer production, fruit preservation and horticultural practices

Program Specific outcome: M.Sc. (Botany)	
1.	PSO-1. Students acquired knowledge through practical work in fields as well as in laboratory. PSO-2. Students are expose to various industrial process by industrial training. PSO-3. Project helps for creating research attitude among the post graduate students

Course Outcomes of B.Sc. (Subject):

Term- I

Class	Course title	Outcome
FYBSc (Paper-I)	Fundamentals of Botany	Co-1 Study of morphology & Anatomy of lower plants Co-2 know about life cycle of different plant groups i.e. cryptogams and phanerogams Co-3 Evolutionary study of plants Co-4 Study of Classification of plants
FYBSc- (Paper-II)	Industrial Botany	Co-1 Introduction to plant resources Co-2 Floriculture industry – study of important floriculture crops, Green house technology, cultivation practices Co-3 Concept and types of nursery and propagation methods Co-4 Study of plant tissue culture industry

		Co-5 Study of organic farming, Seed industries Co-6 Study of Mushroom cultivation and commercial production
FYBSc-(Paper-III)	Practical based on theory paper I& II	Co-1 Study of anatomy and morphology of different plants Co-2 Study of artificial plant propagation techniques Co-3 Study of techniques in plant tissue culture Co-4 Cultivation of mushrooms Co-5 Study of biofertilizers and biopesticides Co-6 Preparation of jams, squash,etc.

Term-II

Class	Course title	Outcome
FYBSc (Paper-I)	Fundamentals of Botany	Co-1 Study of morphology & Anatomy of higher plants Co-2 Know about different types of infloroscences and parts of typical flower Co-3 Types of fruits and seeds Co-4 Tissue differentiation and different types of tissues Co-5 Internal origination of primary plant body
FYBSc-(Paper-II)	Industrial Botany	Co-1 Introduction, production and advantages of Bio-fuel industries Co-2 Study of bio-pesticides, IPM, concept of Biocontrol Co-3 Biofertilizer concept , types, products and commercial significance Co-4 Fruit processing industries, cold storages, types of processing Co-5 Study of ayurvedic formulations using specific plants and use of plants as neutraceuticals and pharmaceuticals
FYBSc-(Paper-III)	Practical based on theory paper I& II	Co-1 Study of anatomy and morphology of different plants Co-2 Study of artificial plant propagation techniques Co-3 Study of techniques in plant tissue culture Co-4 Cultivation of mushrooms Co-5 Study of biofertilizers and biopesticides Co-6 Preparation of jams, squash,etc.

Semester I

SYBSc-(Paper-I)	Taxonomy of Angiosperms	Co-1 Know principals of taxonomy, methods in taxonomy Co-2 Types of taxonomy, Sources of data for taxonomy CO-3Methods of preparation of Herbarium, E- Herbarium etc.
SYBSc (Paper-II)	Plant Physiology	Co-1Applications of plant physiology, Mechanism of Absorption of water, Transpiration Co-2 Plant growth and growth regulators, Nitrogen Metabolism in plants Co-3 Physiology of flowering

Semester II

SYBSc (Paper-I)	Plant Anatomy and Embryology	Co-1Know different tissue systems in plants Co-2Normal secondary growth and different types of anomalous secondary growth Co-3 Study of male and female gametes in angiosperms, Process of fertilization and types of endosperms and structure of embryo.
SYBSc (Paper-II)	Plant Biotechnology	Co-1Know various application of biotechnology like Enzyme technology, Fermentation technology Co-2Single Cell Proteins and Environmental biotechnology Co-3Know Basics of Plant Genetic Engineering, Methods of gene transfer in plants and applications of plant genetic engineering in crop improvement Co-4 Knowledge about Nanotechnology and its applications in Agriculture
SYBSc (Paper-III)	Practical based on theory paper I & II	Co-1Know practical knowledge of plant family of angiosperms Co-2Study of different ecological groups and methods to study vegetations in forests Co-3Study different parameters of plant physiology like WHC, DPD, Rate of transpiration and Different instruments used in physiology Co-4 Study of Different tissue systems and normal and anomalous secondary growth Co-5 Study of fermentation techniques, *Spirullina* cultivation for SCP

Semester I

TYBSc (Paper-I)	Cryptogamic Botany	Co-1 Systematics and Taxonomy Co-2 Evolution from Cryptograms to phanerogams Co-3 Classification, economic and ecological importance.
TYBSc (Paper-II)	Cell and Molecular Biology	Co-1 Cell biology gives the knowledge of Internal organization of the cell Co-2 Cellular signaling, transport and trafficking, Cellular Processes. Co-3 Molecular biology provides the Gene structure and Function, DNA: Structure, Functions and Damage
TYBSc (Paper-III)	Genetics and Evolution	Co-1Genetics provides knowledge regarding Classical Genetics, Microbial Genetics & Cytogenetics Co-2 Plant Breeding Co-3Evolution provides Information about Darwin theory and lamark's theory
TYBSc	Spermatophyta	Co-1 SPERMATOPHYTA gives knowledge of general

(Paper-IV)	and Palaeobotany	characters, economic importance and classification of Gymnosperm and Angiosperm. Co-2 PALAEOBOTANY provides the information regarding the Fossils.
TYBSc (Paper-V)	Horticulture and Floriculture	Co-1 Understand economic importance of plant and plant product. Co-2 Know the methods of plant propagation. Co-3 Understand the fruit & vegetables production technology, scope & importance of floriculture. Co-4 Methods of cultivation of different flowering plants.
TYBSc (Paper-VI)	Computational Botany	Co-1 Study the scope & importance of biostatistics. Co-2Know scope and some basic commonly used terms like sampling, data, dispersion, population, central tendency etc. Co-3Knowledge to apply statistical analysis to biological data for testing different hypothesis.

Semester II

TYBSc (Paper-I)	Plant Physiology and Biochemistry	Co-1Plant physiology and Biochemistry give knowledge regarding the Photosynthesis, Respiration, Translocation of organic solutes Co-2 Carbohydrates, Amino acids and proteins, Secondary Metabolites
TYBSc (Paper-II)	Plant Ecology and Biodiversity	Co-1 Know the biotic and abiotic components of ecosystem. Co-2Food chain & food web in ecosystem. Co-3Understand diversity among various groups of plant kingdom. Co-4Understand plant community & ecological adaptation in plants. Co-5Scope, importance and management of biodiversity.
TYBSc (Paper-III)	Plant Pathology	Co-1 Study scope and importance of plant pathology. Co-2 Know disease cycle and disease development, Co-3 Effect of plant diseases on economy of crops. Co-4 Know the methods of studying plant diseases They can identify the plant diseases like bacterial, nematode, and fungal, disease forecasting. Co-5Study prevention and control measures of plant diseases.
TYBSc (Paper-IV)	Medicinal and Economic Botany	Co-1 Understand scope and importance of pharmacognosy. Co-2 Know the cultivation, collection, processing & importance of various herbal drugs and scope of economic botany. Co-3 Know the botanical resources like non wood forest products and study the concept of Ayurvedic pharmacy.
TYBSc	Plant	Co-1 Study of Plant tissue culture Technology and

(Paper-V)	Biotechnology	Recombinant DNA technology Co-2 Understand Role of microbes in agriculture, medicine & industry. Co-3Study the concept of bioinformatics & genomics proteomics.Understand technical germplasm & cryopreservation.
TYBSc (Paper-VI)	Plant Breeding and Seed technology	Co-1 Study the scope & importance of plant breeding. Co-2 Study the technique of production of new superior crop varieties, heterosis, hybrid vigor etc. Co-3 Know the process of hybrid variety, development & their release. Co-4 Know about seed germination, processing , production etc.
TYBSc (Paper-VII)	Practical I	Co-1 Study of Vegetative and Reproductive structure of Algae, Fungi, Bryophytes and Pteridophytes Co-2 Study techniques of cytology, Mitosis, Meiosis, Chromosome morphology Co-3 Estimation of DNA and RNA Co-4 Estimate Chlorophyll, TLC, Proteins and Amino acids Co-5 Study of advanced biotechnological techniques
TYBSc (Paper-VIII)	Practical II	Co-1 Study plant families Co-2 Study structural heterozygote's, Gene mapping, Co-3 Study of Vegetative and Reproductive structure of gymnosperms and Pleobotany
TYBSc (Paper-IX)	Practical III	Co-1 Study techniques in Horticulture and floriculture like cutting, Layering, Budding, Grafting Co-2 Calculating Mean mode median, methods of graphical presentations Co-3Study different plant diseases like fungal, bacterial, microbial etc. Co-4 Study medicinal plants and methods of preparation of extracts and quantitative analysis of alkaloids, tannins etc.

Course Outcomes of M.Sc (Botany):

Semester I

Class	Course title	**Outcome**
M.Sc. I	BOTANY. BO.1.1 Cryptogamic BOTANY:	CO-1. To study the classification of Bryophytes and Pteridophytes. CO-2. Understand the evolutionary relationships between plant groups. CO- 3. Know about systematic classification & nomenclature. CO-4. Knows about taxonomic aspects of Cryptogamic plants.

M.Sc. I	BO.1.2 PLANT PHYSIOLOGY AND BIOCHEMISTRY:	CO-1.Knows about plant water relations, Transport of solute CO2.Understand physiological aspects of plants. CO-3. Study metabolism of plants. CO-4. Study plant growth regulators. Flowering, fruiting CO-5. Know about agro-Electronics CO- – Know about Enzymes and Biomolecules such as amino acids, carbohydrates, Proteins
M.Sc. I	Genetics and Plant Breeding	CO-1.Study of Classical genetics CO-2. Study of recombination, Linkages and Mutations CO-3. Study of Microbial Genetics and Cytogenetics CO-4. Study of Different Techniques of Plant Breeding.
M.Sc. I	BO.1.4 BOTANICAL TECHNIQUES	CO-1. Study of microscopy CO-2.Study of chromatographic, electrophoretic techniques CO-3.Spectroscopic and radioactive techniques Co-4 Centrifugation, Electrochemical techniques and immunological techniques

Course Outcomes of M.Sc (Botany):

Semester II

Class	Course title	Outcome
M.Sc. I	BOTANY. BO.2.1 Cryptogamic	CO-1. To study the classification of Algae and Fungi. CO-2. Understand the evolutionary relationships between plant groups. CO- 3. Know about systematic classification & nomenclature. CO-4. Knows about taxonomic aspects of Cryptogamic plants.
M.Sc. I	BO.2.2 CELL AND MOLECULAR BIOLOGY:	CO-1.Knows about cell structure and cell organelles CO2.Cell Signalling and Cell cycle. CO-3. Study of Evolution, Cellular and Miolecular evolution.
M.Sc. I	Bo. 2.3 Molecular Biology and genetics Engineering	CO-1.Study of Structure and properties of Nucleic acid. CO-2. Study of Gene structure, Transcription and Translation. CO-3. Study of Recombinant DNA technology CO-4. Isolation of Gene plant genetic Eng. and differentBlotting methods
M.Sc. I	BO.2.4 Plant Ecology and Phytogeography	CO-1. Study of Relations of Plant with environment CO-2.Study of population ecology CO-3. Study of ecosystem types. Co-4 Study of Phytogeography

Course Outcomes of M.Sc (Botany):

Semester III

Class	Course title	Outcome
M.Sc. II	BOTANY. BO.3.1 SPERMATOPHYTIC BOTANY:	CO-1. To study the classification o gymnosperm & angiosperms. CO-2. Understand the relationship between living & non living fossil gymnosperms CO- 3. Know about systematic classification & nomenclature. CO-4. Knows about taxonomic aspects of angiosperms.
M.Sc. II	BO.3.2 DEVELOPMENT AND ECONOMIC BOTANY:	CO-1.Knows the concept, features & process of plant development. CO-2.Understand embryological aspects of development. CO-3. Know about the polyembryony, apomixis, parthenogenesis etc. CO-4. They also understand physiology, molecular basis of development CO-5. Know about various spices, millets, leguminous crop plants and their economic importance.
M.Sc. II	BO.3.3 INDUSTRIAL BOTANY-1	CO-1. Gain idea about economically important algae their cultivation & application. CO-2. Gain knowledge about methods of preparation & applications of biopesticides. CO-3. Understand floriculture & its importance. CO-4. Get ideas about different types of fruits. CO-5. Knows methods, processing of preservation of fruits.
M.Sc. II	BO.3.4 ADVANCED ANGIOSPERMS	CO-1. Gain scientific knowledge of modern trends in Angiosperm taxonomy CO-2.Understanding Phytogeography, ecology, genetics and taxonomy related to angiosperms. CO-3. Gain knowledge about molecular systematics, ultrasystematics Co-4 Study of morphological variations, systematic position, interrelationships of different plant families

Course Outcomes of M.Sc (Botany):

Semester IV

Class	Course title	Outcome
M.Sc. II	BO.4.1- COMPUTATIONAL BOTANY	CO-1. Know the basic terms and test of hypothesis in biostatistics. CO-2. Understand the technical experimental statistics. CO-3. Know the concept of bioinformatics. CO-4. To know the concept of sampling methods and

		analysis of biostatical data in Botany.
M.Sc. II	. Bo.4.2- PLANT ORGANISM INTERACTION.	CO-1. Understand various kinds of plant-plant interaction like epiphytic plant, parasitic plant and Plant association. CO-2. Understand the interaction between herbivorus, carnivorus, and omnivores organisms. CO-3. Know the symbiotic association between various organism lke lichen, mycorrizae etc. CO-4. Understand the mechanism of seed dispersal and pollination.
M.Sc. II	BO.4.3- INDUSTRIAL BOTANY-II	CO-1. Know the concept, scope and importance of herbal technology. CO-2. To study the various type of plants such as Aromatic, medicinal etc. CO-3. Understand the floriculture and its importance. CO-4. Get ideas of gardening methods and landscaping. CO-5. Gain knowledge about Plant tissue culture techniques. CO-6. Know the ideas about fruit preservations.
M.Sc. II	BO.4.4- PLANT PATHOLOGY	CO-1. Know the concept, scope and importance of Plant pathology. CO-2. Understand courses of disease development. CO-3. Account of Plant disease classification.

Program outcome: M.Phil. (Botany)	
M.Phil. (Botany)	1. M.Phil. Botany or Master of Philosophy in Botany is a postgraduate Botany course. Botany is a branch of biology and is the scientific study of plant life and development. Botany covers a wide range of scientific disciplines that study higher plants, algae, and fungi including structure, growth, reproduction, metabolism, development, diseases, and chemical properties and evolutionary relationships between the different groups. The duration of this pre-Doctorate degree, generally, is two years. The degree course is career orienting in nature which opens a lot of job scopes for the candidates after its completion. 2. **M.Phil. Botany Course Suitability** They should have clear and concise verbal and written communication skills, a high level of curiosity about the world around them, be creative in solving problems. Other essentials are a good understanding of the scientific method and the rigors of scientific research and detail-oriented in their work. They must have good interpersonal skills, mental stamina to work long hours, the ability to work with microscopes and computer skill. Those who are willing (also want to pursue their Ph.D.) to go for teaching fields at higher degree level i.e. college and university level both in private and government institutions also are suitable for it.

	3. **M.Phil. Botany Employment Areas** Drug Companies Lumber and Paper Companies The Chemical Industry Food Companies Educational Institutes The Oil Industry Biotechnology Firms Biological Supply Houses Fruit Growers Seed and Nursery Companies Fermentation Industries 4. **M.Phil. Botany Job Types** Botany Research Ofcer Botany Lecturer Clinical Business Associate Medical Representative Nutrition Specialist Phlebotomist

Program outcome: Ph.D. (Botany)	
Ph.D. (Botany)	1 Ph.D. in Botany is 3-year doctorate degree in Botany. Botany is a branch of biological science that focuses on the study of plants and how they survive and interact with other living and nonliving components of the environment. At undergraduate and graduate levels, the curriculum of the course typically consists of lecture-based lessons, lab sessions, and field research. Doctoral programs however, focus more on research. 2. **Ideal candidates for the course would possess:** • data-handling skills such as recording, collating, and analyzing data using appropriate techniques and equipment. • written communication skills • presentation and oral communication skills such as to present research findings and make presentations in a clear, succinct way. • project management skills, such as organizing and undertaking research projects, experiments, etc. (including budgeting, contingency planning, and time management). • good understanding of information technology • ability to work both independently and as part of a team. 3. **On completion of the programme, students will be able to:** • Demonstrate critical understanding, at an advanced level, of up-to-date knowledge and research methodology of a particular field • Implement effective academic and personal strategies for carrying out research projects independently and ethically • Contribute original knowledge in response to issues in their specialist area • Communicate research findings at a diverse range of levels and through a variety of media • Evaluate one's own research in relation to important and latest issues in the field **4. Engage in critical intellectual enquiry** • *Critically evaluate information and ideas from multiple perspectives Integrate knowledge at the forefront of a particular field* **5. Demonstrate a thorough understanding of research methodologies and techniques at an advanced level** • *Develop, design and implement research projects competently and*

independently

6. Conduct innovative, high-impact and leading edge research

- *Engage in original research that takes a new technological, methodological, or theoretical approach*

7. Provide novel solutions to complex problems

- *Identify and define emerging problems Offer innovative and original solutions to problems and issues in novel situations*

8. Demonstrate adherence to personal and professional ethics

- *Maintain the highest standards of personal and academic integrity Understand complex ethical and professional issues*

9. Demonstrate leadership and advocacy skills

- *Articulate analyses and propose solutions in response to social issues Communicate and disseminate research findings effectively in the academic community and to stakeholders in society*

10. Work with others and make constructive contributions

- *Engage in intellectual exchange with researchers from other disciplines to address important research issues Collaborate effectively with researchers from different cultures*

JOB OPPERTUNITIES

Taxonomist -Taxonomists research about, and sub-divide types of plants into classifications, subsequent to observing their species and grouping them based on similitudes

Agronomist -Agronomist are soil and plant researchers who work to enhance the yield of field crops like grain and cotton. They develop techniques that help farmers in creating more yield and avoiding harvest-failures

Ecologists -Ecologists observe and research on plants' relationship and behavior with the soil and with other living beings. They research on the biological categories of plants with the objective of explaining their life phenomena.

Mycologists- Mycologists consider growth patterns and how harming living beings harms vegetation. Mycologists are a kind of Microbiologists that observe and analyze microscopic organisms and green growth in relation to microorganisms.

Plant Breeders -Plant Breeders apply customary hybridizing and crossbreeding methods, instead of hereditary building, to enhance plants for human use, with focus on nature's conservation. Plant Breeders are a type of Plant Geneticists, and Geneticists work directly in the science of plant genomes.

Department of Hindi (2018-19)
Course Outcomes of BA

Class	Outcome
F.Y.B.A	1. छात्रों को हिंदी काव्य साहित्य का परिचय देना । 2. हिंदी कहानी साहित्य से अवगत कराना । 3. हिंदी भाषा द्वारा संवाद कौशल विकसित करना । 4. मौलिक लेखन की ओर रूझान बढ़ाना । 5. विज्ञापन लेखन कौशल विकसित करना । 6. अनुवाद संबंधी जानकारी देना । 7. हिंदी कंप्यूटिंग का परिचय देना ।
F.Y.B.Com.	1. छात्रों को हिंदी के गद्य एवं पद्य के प्रतिनिधि रचनाकारों का परिचय देना । 2- छात्रों में नैतिक मूल्य, राष्ट्रीय मूल्य, सामाजिक मूल्यों के प्रति आस्था निर्माण करना । 3- पारिभाषिक ब्दावली के माध्यम से छात्रों को वाणिज्य तथा बैंकों में प्रयुक्त हिंदी शब्दों से परिचित कराना । 4- पत्रलेखन, विज्ञापन लेखन आदि के माध्यम से छात्रों को भाषा के रचनात्मक पहलू से परिचित कराना । 5-संक्षेपण आदि के माध्यम से छात्रों की विचार क्षमता तथा कल्पना-शक्ति को बढाना ।
S.Y.B.A	1. छात्रों को हिंदी के प्रतिनिधि कहानीकारो एवं कवियो से परिचित कराना। 2. छात्रों को हिंदी कहानी एवं नई कविता की विषेषताआ से परिचित कराना। 3. छात्रों को हिंदी के कार्यालयीन एवं व्यावहारिक पत्रों के स्वरूप का ज्ञान देना। 4. छात्रों को पारिभाषिक शब्द, विज्ञापन, भेंटवार्ता/साक्षात्कार, रिपोर्ट लेखन आदि हिंदी भाषा के व्यावहारिक क्षेत्रो से परिचित कराना।
T.Y.B.A	1. छात्रों को हिंदी आत्मकथा विधा तथा हिंदी की दीर्घ कविता/काव्य नाटक के विकास तथा उनके स्वरूप का परिचय देना। 2. छात्रों को पारिभाषिक शब्द तथा संक्षिप्तियों के माध्यम से सरकारी कार्यालय में प्रयुक्त की जानवाली कार्यालयीन हिदी से परिचित कराना। 3. छात्रों को सरकारी पत्रलेखन की पदधति से अवगत कराना। 4. छात्रों को कार्यालयीन कार्यपदधति की जानकारी देना । 5. छात्रों को सरकारी पत्राचार स्वरूप, भाषा शैली आदि की जानकारी देना। 6. छात्रों को अनुवाद प्रक्रिया तथा कार्यालयीन अनुवाद से अवगत कराना। 6. छात्रों को को राजभाषा हिंदी का संवैधानिक प्रावधान, हिंदी प्रचार प्रसार कार्य से परिचित करना। 7 छात्रों को पारिभाषिक वाक्य एव संक्षिप्तियों से अवगत कराना।

Class	Outcome

S.Y.B.Sc Semester I & II	1 पठित कहानियों एवं पाठों के आधार पर छात्रों को शैलीगत एवं विधागत अध्ययन का परिचय कराना। 2. पठित काव्य रचनाओं के माध्यम से छात्रों को हिंदी काव्य की प्रमुख प्रवृत्तियों एवं प्रदेय की जानकारी देना। 3. छात्रों को काव्य के भाव एवं शिल्पगत सौंदर्य का आस्वादन कराना। 4. छात्रों को शुद्ध हिंदी लेखन की नियमावली का ज्ञान देकर अशुद्धयों के प्रति सचेत कराना। 5. छात्रों को पारिभाषिक शब्दावली, सारलेखन तथा अनुवाद के अभ्यास द्वारा व्यावहारिक हिंदी की जानकारी देना।

Course Outcomes of M.A
Semester I

Class	Outcome
M.A.-I	1. हिंदी की मध्ययुगीन काव्य प्रवृत्तियों का परिचय देना। 2. मध्ययुगीन काव्य प्रवृत्तियों की पृष्ठभूमि पर कवि विषेश की रचनाओं का परिचय कराना। 3. तत्कालीन काव्यभाषां की प्रवृत्तियों का परिचय देना। 4. पाठ्यकृतियों के आधार पर काव्य मूल्यांकन की क्षमता का विकास करना। 5. सर्जनात्मक कौशल विकसित करना। 6. छात्रों को हिंदी भाषा की प्रमुख प्रयुक्तियो और प्रयोजनमूलक शैलियों का परिचय देना । 7. छात्रों को हिंदी में कम्प्यूटर के प्रयोग की विधि से अवगत कराना । 8. छात्रों में हिंदी के कार्य साधक प्रयोग की कुशलता विकसित करना । 9. छात्रों को पत्राचार के विविध प्रकारो की जानकारी कराना । 10. छात्रों में अन्य भाषा से हिंदी भाषा में अनुवाद की क्षमता को विकसित करना । 11. छात्रों को पारिभाषिक शब्दावली के माध्यम से प्रयोजनमूलक हिंदी से परिचित करना ।
M.A.-II	1.हिंदी साहित्य की आदिकालीन तथा भक्तिकालीन काव्य प्रवृत्तियों की जानकारी देना । 2. छात्रों को प्राचीन तथा मध्ययुगीन काव्य-कृतियों का परिचय कराना। 3. प्राचीन तथा मध्ययुगीन कवियो की काव्य कला से छात्रों को अवगत कराना। 4. छात्रों को हिंदी की प्राचीन तथा मध्ययुगीन काव्य परंपरा से परिचित कराना। 5. छात्रों को प्राचीन तथा मध्ययुगीन हिंदी भाषा से अवगत कराना। 6. छात्रों को भारतीय साहित्यशास्त्र के विकासक्रम से परिचित कराना।

	7. छात्रों को भारतीय साहित्यशास्त्र के सिद्धांतां का ज्ञान कराना। 8. साहित्य और साहित के सहसंबंधो से छात्रों को अवगत कराना। 9. छात्रों को साहित्यशास्त्रीय चिंतन से परिचित कराना। 1०. छात्रों को भारतीय साहित्यशास्त्र के सिद्धांतों में साम्य-वैषम्य एवं उसके कारणों का ज्ञान कराना। 11. छात्रो को साहित्यशास्त्रीय समीक्षा का महत्व अवगत कराना। 12. साहित्यशास्त्रीय अध्ययन के माध्यम से छात्रों में समीक्षात्मक दृष्टि विकसित करना।
M. Phil.	1. छात्रों में शोध कार्य की जिज्ञासा बढाना। 2. छात्रों को शोध प्रविधि से अवगत कराना । 3. शोध दृष्टि को विकसित करना। 4. नये शोध प्रवाहों से परिचित कराना। 5. शोध प्रक्रिया और शोध प्रबंध लेखन कौशल विकसित करना ।
Ph. D.	1. अनुसंधान प्रक्रिया का स्वरूप एवं उपयोजन की जानकारी देना। 2. अनुसंधान प्रक्रिया के विविध आयामों से परिचित कराना। 3. अनुसंधान प्रक्रिया के स्वरूप एवं उपयोजन की जानकारी देना। 4. अनुसंधान प्रक्रिया के संदर्भ में आवश्यक तथ्यो से अवगत कराना। 5. अनुसंधान विषय-चयन, सामग्री संकलन, हस्तलेखन-संकलन एवं सामग्री विश्लेषण की जानकारी देना। 6. अनुसंधान की प्रविधि से परिचित कराना।

Department of Marathi (2018-19)

Program outcome : B.A. (Marathi)	
1.	विशिष्ट कालखंडाच्या पार्श्वभूमीवर साहित्यामागील प्रेरणा प्रवृत्तींचे ज्ञान करून घेतो.
2.	चिकित्सक अभ्यासाची क्षमता विकसित होते.
3.	जागतिकीकरणात विविध क्षेत्रांना सामोरे जाण्यासाठी भाषिक क्षमता विकसित करणे.
4.	विविध प्राकारची लेखनकौशल्ये विकसित करणे.
5.	आस्वाद घेण्याची क्षमता विकसित करणे.
6.	वाङ्मयीन व्यवहार व प्रकाशन व्यवसायाचे स्वरूप समजते.
7.	समीक्षा करण्याची दृष्टी व क्षमता विकसित होते

Program outcome : M.A. (Marathi)	
1.	विद्यार्थ्याला आपल्या आवडीचे संशोधनाचे क्षेत्र निश्चित करता येते.
2.	मराठी भाषा आणि वाङ्मयाचे प्रगत ज्ञान प्राप्त होते.
3.	समकालीन वाङ्मयीन प्रवाहांचे नीट आकलन होते.
4.	वाङ्मयीन प्रश्नांविषयी विचार करण्याची जाण निर्माण होते.
5.	वाङ्मयीन आणि जीवनविषयक जाणीव प्रौढ होते.
6.	चिकित्सक अभ्यासाची क्षमता विकसित होते.
7.	विद्यार्थ्याला लेखनगुणांना उत्तेजन मिळते.

Program Specific outcome : B.A. (Marathi)	
1.	मराठी साहित्यातील भिन्न- भिन्न प्रवाह आणि प्रकार लक्षात घेणे.
2.	विद्यार्थ्याच्या वाङ्मयीन अभिरूचीचा विकास करणे.
3.	संशोधनाची संकल्पना, प्रायोजने आणि विविध संशोधन पध्दती समजावून घेतो.
4.	व्यक्तिमत्त्व विकासासाठी भाषिक कौशल्ये विकसित करणे.
5.	प्रसारमाध्यमांसाठी विविध प्रकारची लेखन कौशल्ये आत्मसात करणे.

Program Specific outcome : M.A. (Marathi)	
1.	विशिष्ट कालखंडातील साहित्याच्या व्याप्तीबद्दल जाण निर्माण होण्यास मदत होते.
2.	विषयाच्या चिकित्सेची समज वाढविणे.
3.	साहित्यकृतीच्या,साहित्यप्रकाराच्या तौलनिक अभ्यासाबाबत दिशा, व्याप्ती आणि मर्यादा यांची समज निर्माण होण्यास मदत करणे, अशा अभ्यासाची क्षमता वाढविणे
4.	साहित्याच्या व्यवच्छेदक लक्षणाबाबत विचारांची आणि वाङ्मयीन मूल्यमापनाची सवय लावणे.

Course Outcomes of BA (Marathi)

Class	Course title	Outcome
FYBA	MAR 1024	1 मराठी साहित्य, मराठी भाषा आणि मराठी संस्कृती यांचा क्रमश: परिचय करून घेतो.

	आधुनिक मराठी वाङ्मय - सामान्य स्तर-1	2 मराठी साहित्यासंबंधी रूची निर्माण होते. 3 वाङ्मयीन अभिरूचीचा विकास होतो. 4 मराठी साहित्यातील भिन्न भिन्न प्रवाह व प्रकार लक्षात येतात. 5 व्यक्तिमत्त्व विकासात भाषेचे महत्व स्पष्ट होते. .
SYBA	MAR 2024 आधुनिक मराठी आणि उपयोजित	१ आत्मचरित्रात्मक वेच्यांचे आकलन , आस्वाद आणि मूल्यमापन करण्याची क्षमता विकसित होते. शुद्धलेखनाची ओळख होते. 2 पारिभाषिक संज्ञांचा परिचय होतो. ३.चरित्र, आत्मचरित्र या साहित्यप्रकारांच्या तात्विक घटकांचे ज्ञान प्राप्त होते. 4 मराठीतील निवडक चरित्र, आत्मचरित्रांची ओळख होते.
SYBA	MAR 2025 मराठी साहित्यातील विविध साहित्यप्रकार - विशेष स्तर-1	1 मराठी साहित्यातील तात्विक घटकांचे ज्ञान प्राप्तहोते. 2 वेगवेगळ्या कालखंडातील मराठीतील अभिजात साहित्यकृतींचा संस्कार घडतो. 3 साहित्याविषयीची अभिरूची निर्माण होते. 4 साहित्यकृतींला मुक्त प्रातिसाद देण्याची क्षमता निर्माण होते. 5 साहित्यकृतीचे आकलन, आस्वाद आणि मूल्यमापन करण्याची क्षमता विकसित होते.
SYBA	MAR 2026 अर्वाचीन मराठी वाङ्मयाचा इतिहास - 1818 ते 1960 - विशेष स्तर 2	1 अभ्यासाच्या प्रारंभी विद्यार्थी मराठी साहित्याच्या ऐतिहासिक परंपरेचे ज्ञानप्राप्त करून घेतो. 2 विशिष्ट कालखंडाच्या पाश्वभूमीवर साहित्यामागील प्रेरणा प्रवृत्तींचे ज्ञान करून घेतो. 3.साहित्यप्रकारांच्या विकसनशील परंपरेचे स्थूल ज्ञान करून घेतो. 4. विद्यार्थी पदव्युत्तर अभ्यास करण्याची तयारी करतो.
TYBA	MAR-3024 आधुनिक मराठी साहित्य आणि व्यवहारिक व उपयोजित मराठी - सामान्य स्तर 3	1. आधुनिक मराठी साहित्यातील विविध साहित्यप्रकारांचा परिचय होतो. 2. साहित्याबद्दलची अभिरूची विकसित होऊन कलाकृतीचा आस्वाद घेण्याची क्षमता विकसित होते. 3. भाषेचे यथोचित आकलन करून तिचा वापर करण्याची क्षमता विकसित होते. 4. निबंध व प्रवासवर्णन या साहित्यप्रकारांचे ज्ञान मिळते.
TYBA	MAR-3025 साहित्यविचार - विशेष स्तर 3	1. साहित्याचे स्वरूप समजून घेतो. 2. वाङ्मयीन मूल्यांचा परिचय होतो. 3. साहित्याची प्रयोजने जाणून घेतो. 4. साहित्य आणि समाज यांच्यातील परस्पर संबंध समजून घेतो. 5 साहित्य निर्मितीची तत्वे जाणतो.
TYBA	MAR-3026	1. भाषेचे स्वरूप व कार्य, भाषेच्या अभ्यासाचे महत्व , भाषेच्या प्रमुख

	भाषाविज्ञान- विशेष स्तर-4	अंगांचा परिचय करून घेतो. 2. भाषेचे मानवी जीवनातील कार्य व महत्व जाणून घेतो. 3. वेगवेगळ्या भाषाभ्यास पध्दतीचे वेगळेपण व महत्व जाणून घेतो. 4. मराठी भाषेचा उत्पत्तीकाल जाणून तत्कालीन भाषिक स्थित्यंतराचा परिचय होतो. 5.मराठी भाषेचा ऐतिहासिक परिचय होतो.

Semester I & II

SYBSc-	MAR- 83111 , 83112 मराठी विज्ञान साहित्य आणि व्यवहारिक मराठी	1. मराठी विज्ञान साहित्याची अभिरूची निर्माण होते. 2. वैज्ञानिक जाणिवा निर्माण होतात. 3. विज्ञान, उद्योगातील विविध प्रवाह संधी इ.चा परिचय होतो. 4. लेखन, वाचन, आकलन संभाषण ही भाषिक कौशल्ये विकसित होतात. 5.वैज्ञानिक, कार्यालयीन, व्यावसायिक माहिती घेऊन पारिभाषिक संज्ञांची ओळख होते..

Course Outcomes of M.A (Marathi):

Semester I

Class	Course title	Outcome
M.A.-I	MAR-10431 व्यवहारिक आणि उपयोजित मराठी भाग 1	१. विविध स्तरावरील भाषिक कौशल्ये व क्षमता विकसित होते. २ भाषाव्यवहाराचे औपचारिक आणि अनौपचारिक क्षेत्रनिहाय स्वरूप समजते. ३ व्यक्तिमत्व विकासासाठी भाषिक कौशल्ये आत्मसात होतात. ४ प्रासारमाध्यमांचे स्वरूप व त्यासाठी भाषाव्यवहाराचे स्वरूप लक्षात येते.
M.A.-I	MAR-10432 मध्ययुगीन मराठी वाङ्मयाचा इतिहास:प्रारंभ ते 1600	१प्राचीन धर्मपंथ संप्रदाय व वाङ्मय यांचे परस्पर संबंध समजून घेतो. 2 राजकीय स्थित्यंतरे आणि मराठी साहित्य निर्मितीतील संबंध जाणून घेतो. 3. मराठी संत परंपरेचे योगदान व महत्व जाणतो. ४ महानुभाव संप्रादायाचे कार्य जानतो.
M.A.-I	MAR-10433 भाषाविज्ञान :वर्णनात्मक	१ स्वनिम निर्मितीची प्राक्रिया समजावून घेतो. २ वागिद्रियाची रचना व कार्य समजावून घेतो. ३ वाक्यविन्यास व अर्थविन्यास संकल्पनांचा भाषेचे वेगळेपण व महत्व जाणून मानवी जीवनातील कार्य व महत्व जाणून घेतो. ४ वेगवेगळ्या भाषाभ्यास पध्दतीचा परिचय होतो.
M.A.-I	MAR-10434 ग्रामीण साहित्य	१.स्वातंत्र प्राप्ती नंतरच्या कालखंडात ग्रामीण साहित्याच्या निर्मितीची कारणपरंपरा समजावून घेतो. 2. ग्रामीण साहित्याचे स्वरूप व कार्य यांची चिकित्सा करतो.

		3. ग्रामीण साहित्यातील विविध वाङ्मयप्राकारांचा विकास कसा होत गेला याचे मूल्यमापन करतो. 4.ग्रामीण साहित्याने दिलेले योगदान, त्याच्या विकासाचीगती, दिशा यांची मीमांसा करतो.
Semester II		
M.A.-I	MAR-20431 व्यावहारिक आणि उपयोजित मराठी भाग 2	१. व्यवहार व प्राकाशन व्यवसायाचे स्वरूप समजते. 2. मुलाखत लेखनाची तंत्रे व कौशल्ये यांचा वापर करता येतो. 3.अर्जलेखन आणि पत्रलेखनाचा व्यवहारिक वापर करता येतो. 4. भाषांतर आणि अनुवादप्राकिया यांची तात्विक व व्यावहारिक माहिती मिळते. 5. निवेदन कौशल्याची माहिती होते.
M.A.-I	MAR-20432 मध्ययुगीन मराठी वाङ्मयाचा इतिहास : 1600 ते 1818	1. मराठी साहित्यातील विविध धर्मसंप्रदायाचे महत्व जाणतो. 2 मराठी साहित्यातील राजकिय स्थित्यंतरांचे स्वरूप समजून घेतो. 3. पंडिती काव्याची वैशिष्टये जाणतो. 4.शाहिरी काव्याचे महत्व जाणतो.
M.A.-I	MAR-20433 भाषाविज्ञान : सामाजिक	१. समाजातील भाषा उपयोजनातील विविधता समजावून घेतो. भाषा आणि समाज यांचे परस्पर संबंध जाणतो. 2. सामाजिक भाषाविज्ञानाची नवी संकल्पना जाणतो. 4. भाषा आणि विविध क्षेत्रीय वापराचे महत्व समजून घेतो. 5. प्रामाणभाषा आणि परभाषा संपर्काचे स्वरूप जाणतो.
M.A.-I	MAR-20434 दलित साहित्य	1.स्वातंत्र्य प्राप्ती नंतरच्या कालखंडात दलित साहित्याच्या निर्मितीची कारणपरंपरा समजावून घेतो. 2. दलित साहित्याचे स्वरूप व कार्य यांची चिकित्सा करतो. 3. दलित साहित्याने निर्माण केलेल्या विविध वाङ्मयप्राकारांच्या विकासाचे मूल्यमापन करतो. 4. दलित साहित्यातून व्यक्त होणा-या वेदनांचे व विद्रोहाचे स्वरूप जाणून घेतो.

Course Outcomes of M.A (Marathi):

Semester III

Class	Course title	Outcome
M.A.-II	MAR-30431 प्रसारमाध्यमे आणि साहित्यव्यवहार	१.संधी मिळविण्याची भाषिक क्षमता विकसित होते. २. मुद्रित माध्यमातील विविध कौशल्ये प्रसारमाध्यमातील लेखन कौशल्य आत्मसात करतो. ३. प्रसारमाध्यमांचे समाजातील महत्व जाणतो. ४. प्रसारमाध्यमात सेवेची संधी आत्मसात करतो.

		५. विविध कलांच्या आस्वाद प्राक्रिया जाणून घेतो.
M.A.-II	MAR-30432 साहित्य: समीक्षा आणि संशोधन	१. प्रसारमाध्यमातील लेखन कौशल्य आत्मसात करतो. 2.प्रसारमाध्यमांचे समाजातील महत्व जाणतो. 3. प्रसारमाध्यमात सेवेची संधी मिLविण्यासाठी भाषिक क्षमता विकसित होते. 4. मुद्रित माध्यमातील विविध कौशल्ये आत्मसात करतो. 5. विविध कलांच्या आस्वाद प्राक्रिया जाणून घेतो.
M.A.-II	MAR- 30432 साहित्य: समीक्षा आणि संशोधन	१.एकाच लेखकाचे वाङ्मयीन आकलन, लेखकाच्या व्यक्तिमत्त्वाची जडणघडण समजा}न घेतो. 2.लेखकाचा काळ व त्याची साहित्यनिर्मिती यातील संबंधाचा शोध व त्याव्दारे लेखनातील कालतत्व व चिरंतनतत्व यांचा मागोवा घेतो. 3. साहित्य निर्मितीतील वैविध्य व त्यातील लेखकाचे स्थान व वाङ्मयीन योगदान समजावून घेतो.
M.A.-II	MAR-30434 लोकसाहित्याची मुलतत्वे आणि मराठी लोकसाहित्य	1 .लोकसाहित्याचे स्वरूप समजून घेतो. 2 .लोकसाहित्याची व्यापकता व सर्वसमावेशकता समजून घेतो. 3. लोकसाहित्यातील विविध प्राकार समजावून घेतो. 4.लोकसाहित्यातील सामाजिक, धार्मिक, सांस्कृतिक जाणिवा स्पष्ट होतात.
Semester IV		
M.A.-II	MAR-– 40431 प्रसारमाध्यमे आणि साहित्यव्यवहार	1.वृत्तसंकलनाची प्राक्रिया जाणून घेतो. 2.जाहिरात लेखनाची कौशल्ये विकसित होतात. 3. विविध माध्यमांच्या पटकथा लेखनाचे कौशल्य आत्मसात करतो. 4. विविध साहित्यप्रकारांचे स्वरूप आणि संकल्पना समजून गेतो. 5. रूपांतर कौशल्ये आत्मसात करून घेतो.
M.A.-II	MAR-40432 साहित्य: समीक्षा आणि संशोधन	1. समीक्षा करण्याची दृष्टी व क्षमता विकसित होते. 2. संशोधनाची संकल्पना, प्रायोजने आणि विविध संशोधन पध्दती समजावून घेतो. 3. वाङ्मयीन संशोधनाच्या विविध अभ्यासक्षेत्रांचा परिचय होतो. 4.आंतर्विद्याक्षेत्रीय संशोधनाचे स्वरूप आणि महत्व लक्षात येते. 5. संशोधन करण्याची दृष्टी व क्षमता विकसित होते.
M.A.-II	MAR-40433 विशेष लेखकाचा	1. विविध कलाकृतीतून लेखकाचे योगदान व त्याचे तौलनिक आकलन करून घेतो.

	अभ्यास	2. मध्ययुगीन वारकरी संत परंपरा व तिचे स्वरूप समजावून घेतो. 3. मध्ययुगीन कालखंडातील सामाजिक, सांस्कृतिक व धार्मिक पर्यावरण जाणून घेतो. 4. आधुनिक कालखंडातील लेखनाच्या प्रेरणा जाणतो. 5. आधुनिक लेखकांची वैशिष्टये जाणतो.
M.A.-II	MAR– 40434 लोकसाहित्याची मुलतत्वे आणि मराठी लोकसाहित्य	1 जागतिकिकरणातील लोकसाहित्याचे व लोककलेचे महत्व समजून घेतो. 2 लोकसाहित्याचे इतिहास, पुरातत्वशास्त्र, मानसशास्त्र, भाषाशास्त्र, मानववंशशास्त्र, धर्म शास्त्र इ. शास्त्रांशी असलेला अनुबंध समजून घेतो. 3 मराठी लोकसाहित्याचे विविध कलाविष्कार जाणतो. 4 मराठी लोकसाहित्य अभ्यासकांची परंपरा जाणतो.

Course Outcomes of Ph.D. (Marathi):

Class	Outcome
Programme Outcomes	1. संशोधनाची संकल्पना, प्रायोजने आणि विविध संशोधन पध्दती समजावून घेतो. 2.वाङ्मयीन संशोधनाच्या विविध अभ्यासक्षेत्रांचा परिचय होतो. 3. आंतर्विद्याक्षेत्रीय संशोधनाचे स्वरूप आणि महत्व लक्षात येते. 4. विविध समीक्षा पध्दती जाणून घेतो. 5. मराठी साहित्य समीक्षकांची परंपरा समजा}न घेतो.
Programme Specific Outcomes	1.वाङ्मयीन संशोधनाच्या विविध अभ्यासक्षेत्रांचा परिचय होतो. 2. संशोधनाची संकल्पना, प्रायोजने आणि विविध संशोधन पध्दती समजा}न घेतो. 3. संशोधन करण्याची दृष्टी व क्षमता विकसित होते 4. समीक्षा व्यवहारातील मूल्यकल्पनांचा परिचय करून घेतो. 5 मराठी साहित्य समीक्षकांची परंपरा समजावून घेतो.

Course Outcomes of M.Sc (BIOCHEMISTRY):
Semester I

Class	Course title	Outcome
M.Sc I	Biomolecules	To study the structures of different biomolecules
		Know the levels of protein structure
		Study the need of voitamins
		To ilustrate the cofactor
		Learn about the aequencing of amino acids
	BPT	To study molecular weight of molecules
		According to molecular weight techiques of its seperation
		Determination of viscosity of macromolecules
		Learn industrial Applications of seperation techniques
	Cell biology	To study the cell variability, size and shape of cell
		To study the difference detween plant and animal cell
		According to cell type its structure, function, cell division cycles
		To study cell types and their communication
		To study membrane structure and transport across the membrane
	Enzymology	Learn different types of enzymes and its nomenclatures
		Understand the factors affecting enzymes
		How the regulation activity of enzyme system
		Learn the reactions with respect to enzyme kinetics
		Isolation of enzyme and use in industrial production

Course Outcomes of M.A/M.Sc (Subject):
Semester II

Class	Course title	Outcome
M Sc I	Metabolism	To study the various reactions of catabolism
		Know the synthesis of biomolecules
		Illustrate the role of cofactors in synthesis
		Study of metabolic disorders
	Pllant biochem	Disorder caused due to nutrient deficiency.
		Use of plant growth promoting Hormone
		Structure of plant cell and its organelle
		How plant make their foof by photosynthesis
	Microbiology	Structure of cell organells and their classification
		How the nitogen fixation is carried out
		Cultivation of bacteria and their growth
		Use of microscopic analysis
	Genetics	To study hereditary characteristics

		Understand the laws of mendel about genetics
		To study the aleration and damage of DNA
		learn how to isolate the mutants

Course Outcomes of M.A/M.Sc (Subject):

Semester III

Class	Course title	Outcome
M.Sc	Molecular Biology	Understand the DNA structure and its different forms
		learn the DNA alteration and its repair
		Understand different mechanism of protein synthesis
		To study the protein targeting
	Medical and Immunology	Understand the abnormal conditions of the organ
		Know about the defense mechanism of the body
		Study of autoimmune disorders
		To learn about thr normal and abnormal levels of blood constutuents
	Neuro and spec tissue	Structure and behaviour of brain
		Function of brain and its parts
		Importance of cerebrospinal fluid
		Blood brain barrier
	Toxicology and Plant	Toxic agent found in food
		Effect of cytochrome P=450
		Applications of toxicology
		Detetction of toxic element

Course Outcomes of M.A/M.Sc (Subject):

Semester IV

Class	Course title	Outcome
M. Sc	Physioloy and endocrinology	study of hormone
		Know the mechanism of hormone action
		Know the anatomy of organs
		learn the various mechanism of hormonal action
	Fermentation and tissue culture	Manufacturing of beer, penicillin on industrial scale
		Media require for industrial fermentation
		Plant tissue culture and its applications
	Genetic eng	To study different types of restriction enzymes
		To study DNA manipulations
		Learn types of restriction sites foe cloning vectors
		To understand the concept of recombinant DNA technology
	Food tech and clinical nutrui	Malnutrition and mental disorders
		malnutrition and mental disorders
		acidic and alkaline food
		Food toxins and their effect

Department of B.Voc. Interior Design

Program outcome : B.Voc Interior Design	
After successful completion of three year degree program in B.Voc Interior Design a student should be able to;	
PO-1	Become entrepreneur and work freelance (self-employed), by offering consultancy services directly to individual clients.
PO-2	Design show-homes for builders & property developers.
PO-3	Advise clientele & providing shopping services in specialised furniture and furnishings stores
PO-4	Work with kitchen and bathroom manufacturers to help clients plan their space effectively.
PO-5	Larger interior design and architectural practices may also hire to work alongside more senior personnel
PO-6	In addition to qualification, develop one of the best tools to impress potential clients and/or employers, which is a strong portfolio.
PO-7	Following skills are develop after completion of this course : 1. Communication ability 2. Presentation skills 3. Observation skills 4. Read and interpret building plans, Structural drawing and interior design drawing 5. Understand concepts and principles related to Interior Design and Decoration 6. Supervision and execution of Interior sites works. 7. Analyse and interpret test results for interior materials. 8. Taking various types of measurement for valuation. 9. Draw interior plans manually and by using CAD & 3d Max. 10. Give layout of software 11. Calculate quantities of interior work and prepare estimates. 12. Understand procedure of tender notice and contract agreement. 13. Use computer software. 14. Use standard Professional ethics. 15. Planning and organization of interior & construction activities. 16. Quality control techniques in Interior Design and Decoration. 17. Prepare working drawing for interior work and details. 18. Work as a member of a team and as leader. 19. Write report for given task / project. 20. Understand the treatment required for interior materials. 21. Apply principles of Design in Interior Design and Decoration.

	22. Know the use of equipment and machinery in interior fields.

Program Specific outcome : B.Voc Interior Design	
PSO-1	Incorporate a global perspective when making design decisions, based on sustainable, socio-economic and cultural contexts.
PSO-2	Apply theories of human behaviour to human-centred design solutions.
PSO-3	Apply the design process to generate creative solutions to complex problems optimizing the human experience within the interior environment.
PSO-4	Collaborate in multi-disciplinary teams respecting a variety of points of view and perspectives that enrich the process and product of the team.
PSO-5	Communicate complex ideas clearly to specialists and non-specialists through appropriate oral, written and representational media.
PSO-6	Exemplify accepted standards of professionalism and business practice including a commitment to engage in lifelong learning.
PSO-7	Analyze interiors, architecture, the decorative arts, and art within a historical and cultural context to inform contemporary design solutions.
PSO-8	Synthesize theories and concepts of spatial definition and organization into multi-dimensional design solutions.
PSO-9	Apply theory, psychology and methodology of colour to designs of the interior environment.
PSO-10	Specify furniture, fixtures, equipment and finish materials to meet the design criteria for a variety of interior spaces.
PSO-11	Apply principles of lighting, acoustics, thermal comfort, and indoor air quality as required to enhance the health, safety, welfare, and performance of building occupants.
PSO-12	Produce construction drawings and documents using industry standards for a variety of interior spaces.
PSO-13	Comply with laws, codes, and standards that impact fire safety and life safety.
PSO-14	Employ environment-behaviour research methodologies to address open-ended problems in interior design.

SEMESTER I

F.Y. B.Voc	BASIC DESIGN-I BV ID 1801	CO1- Understand importance of interior design and be able to differentiate between design and decoration. CO2 -Develop knowledge about Basic design in interiors. CO3 - Use tools of interior design based on Aesthetical and Functional aspects. CO4 - Understand the Ergonomics study for different activities. CO5 -Understand the Anthropometric data required for interior designing.
F.Y. B.Voc	BASIC	CO1-To understand & select common building materials

	MATERIALS AND PRODUCTS BVID 1802	based on their properties CO2-To understand & select plumbing, electrical and lighting materials as per requirements. CO3-To understand & select floor coverings based on their properties & requirements.
F.Y. B.Voc	PRIMARY SERVICES BV ID 1803	CO1 - Develop knowledge and concepts of prim CO1ary services CO1Use appropriate resources including optimisation CO2-Design layouts for services CO3-Calculate required illumination for given activity layout. CO4-Choose the required lighting systems or different activities and areas. CO5-Develop knowledge of basic interior services.
F.Y. B.Voc	FURNITURE DESIGN (STUDIO) BVID 1804	CO1 - Improve their sketching skills and drawing abilities CO2-Learn and understand the techniques of various methods of drawing. CO3-Understand the use of colors and their effects in drawing. CO4-Acquire knowledge in the field of interior perspective drawing and sociography. CO5-Improve presentation skills, techniques for construction as a tool towards effective visualization and presentation. CO6-Students should acquire knowledge of the various drawings, which effectively communicate their designs. CO7-Develop sketching abilities using observational drawing methods.
F.Y. B.Voc	PARALINE & PERSPECTIVE PROJECTIONS(STUDIO) BVID 1805	CO1-Use drafting instruments, develop drafting skills. CO1-Use graphical language & lettering techniques; and learn the use of scale and its importance. CO3-Represent 3-D objects in 2-D & 3-D views using parallel lines and converging lines. CO4-Graphically represent annotations, symbols, colour, shades and shadows of objects. CO5-Prepare technical and presentation drawings.
F.Y. B.Voc	COMMUNICATION SKILL (STUDIO) BV ID1806	CO1 - Understand & use basic concepts of Communication in an organisation and social context. CO2-Use reasonably and grammatically correct English language with reading competency. CO3-Utilise the skills to be a competent communicator. CO4-Develop comprehension skills, improve vocabulary, and acquire writing skills.

		CO5-Overcome language and communication barriers with the help of effective communication techniques.
F.Y. B.Voc	MARKET SURVEY-I (STUDIO) BV ID 1807	CO1 - Develop observational and analytical skills. CO2- Develop communication and presentation skills. CO3 - Develop professional ethics and code of conduct.

Semester II

F.Y. B.Voc	BASIC DESIGN-II BV ID 1808	CO1 - Use tools of interior design based on Aesthetical and Functional aspects. CO2-Understand the principles of Design and its implementation in design. CO3-Identify Concepts with approach; Various interior Styles CO4-IdentifyConceptswith approach;Historical Periods CO5-Identify Concepts with approach;Themes.
F.Y. B.Voc	ALLIED MATERIALS AND PRODUCTS BV ID 1809	CO1-Select verities of glass & treatments based on the application & use. CO2-Select Metals & Alloys based on properties and requirements CO3-Select Polymers & Composites based on properties and requirements CO4-Select Paints, varnishes, polishes & coatings based on properties & requirements. CO5-Select the appropriate materials for interior construction. CO6-Select and describe speciality materials.
F.Y. B.Voc	BASIC CONSTRUCTION BV ID 1810	CO1-Describe types of structures, their systems, elements & fundamentals of load transfer. CO2-Select appropriate teakwood joinery while designing furniture items CO3-Describe limitations of joinery CO4-Choose type of doors & windows along with different materials used. CO5-Describe different techniques of laying various floor finishes, erecting & installing the structural floor.
F.Y. B.Voc	INTERIOR DESIGN (STUDIO) BV ID 1811	CO1-Understand the design need and process of planning. CO2-Develop skills in planning of residential and small commercial spaces. CO3-Identify and use appropriate materials in design. CO4-Develop skills in primary services required for the project. CO5-Develop skills in electrical services required for the

		projects. CO6-Identify and list the principles of design used in given interior layout. CO7-Develop manual drafting skills.
F.Y. B.Voc	BASIC CONSTRUCTION (STUDIO) BV ID 1812	CO1-Describe types of structures, their systems, elements & fundamentals of load transfer. CO2-Select appropriate teakwood joinery while designing furniture items CO3-Describe limitations of joinery CO4-Choose type of doors & windows along with different materials used. CO5-Describe different techniques of laying various floor finishes, erecting & installing the structural floor.
F.Y. B.Voc	CAD-I (2D-3D)(STUDIO) BV ID 1813	CO1-Understand the importance of 2D for preparing and exchanging drawings. CO2-Use CADD software. CO3-Increase productivity and lessen rework of drawings thereby saving time. CO4-Use basic CAD command to develop 2D drawings. CO5-Use CAD commands for edit/modification of existing drawings as per needs and suggestions CO6-Use Plotting and printing techniques.
F.Y. B.Voc	MANAGEMENT SKILLS-I (STUDIO) BV ID 1814	CO1-Understand the various Career Opportunities. CO2-Understand the duties and responsibilities of Supervisor interior designer. CO3-Develop generic skills in team work, making decisions, communicating and collaborating. CO4-Understand the office structure and its working. CO5-Develop observational and analytical skills. CO6-Develop professional and work ethics. Implement Processes of design. CO7-Gain first-hand experience in aspects of workshops.

SEMESTER III

S.Y. B.Voc	CONSTRUCTION TECHNIQUES-I BV ID 1815	CO1 - Types of stairs and staircases using different materials. CO2 - Appropriate type of Partitions, Panelling as per requirements. CO3 - Various types of ceilings. CO4 - Appropriate constructional details for various furniture items.

		CO5 - Work out quantities of materials, estimate the cost and do the rate analysis.
S.Y. B.Voc	QUANTITY SURVEYING BV ID 1816	CO1 - Standardized units, modes of measurement of materials, labour & items of work CO2 - Present practices such as Estimating. CO3 - Various functions carried out in an interior designer's office Like Rate Analysis. CO4 - Management, administration of 'design & execution' aspect of an interior project.
S.Y. B.Voc	SECONDARY SERVICES-I BV ID 1817	CO1 - Apply concepts of secondary services CO2 - Use appropriate resources including optimization CO3 - Design layouts for services
S.Y. B.Voc	CONSTRUCTION TECHNIQUES-I (STUDIO) BV ID 1818	CO1 - Types of doors & windows using different materials. CO2 - Types of stairs and staircases using different materials. CO3 - Appropriate type of flooring as per requirements. CO4 - Various types of modular ceilings. CO5 - Appropriate constructional details for various furniture items.
S.Y. B.Voc	ADVANCED INTERIOR DESIGN –I (STUDIO) BV ID 1819	CO1 - Design and plan residential and commercial spaces. CO2 - Develop skills in planning of residential and commercial spaces. CO3 - Identify and use appropriate materials in design. CO4 - Develop skills in primary services required for the project. CO5 - Identify and list the principles of design used in given interior layout. CO6 - Develop manual drafting skills.
S.Y. B.Voc	CADD- II (2 D CADD)(STUDIO) BV ID 1820	CO1 - Understand the importance of 2D for preparing and exchanging drawings. CO2 - Use CADD software. CO3 - Increase productivity and lessen rework of drawings thereby saving time. CO4 - Use basic CAD command to develop 2D drawings. CO5 - Use CAD commands for edit / modification of existing drawings as per needs and suggestions. CO6 - Use Plotting and printing techniques.

S.Y. B.Voc	MARKET STUDY-II (STUDIO) BV ID 1821	CO1 - Develop the ability to relate the theoretical knowledge acquired during lectures to practical activities. CO2 - Develop generic skills in team work, making decisions, communicating and collaborating. CO3 - Gain first-hand experience in aspect of workshops, market surveys, case studies and site visits related to interior design profession. CO4 - Develop observational and analytical skills. CO5 - Develop communication and presentation skills. CO6 - Develop professional ethics and code of conduct.

SEMESTER IV

S.Y. B.Voc	CONSTRUCTION TECHNIQUES-II BV ID 1822	CO1 - Appropriate system for modern kitchens used extensively in interiors. CO2 - Appropriate type of Partitions, Panelling as per requirements. CO3 - Various types of ceilings. CO4 - Appropriate constructional details for various furniture items. CO5 - Work out quantities of materials, estimate the cost and do the rate analysis.
S.Y. B.Voc	QUANTITY SURVEYING & ESTIMATION BV ID 1823	CO1 – Specification Writing with Standardized units, modes of measurement of materials, labour & items of work CO2 - Codes of conduct for ethical practice of interior design profession. CO3 - Present practices such as Tendering and Contracting. CO4 - Design & Execution' aspect of an interior project.
S.Y. B.Voc	SECONDARY SERVICES-II BV ID 1824	CO1 - Apply concepts of secondary services CO2 - Use appropriate resources including optimization CO3 - Design layouts for services.
S.Y. B.Voc	CONSTRUCTION TECHNIQUES-II (STUDIO) BV ID 1825	CO1 - Appropriate system for modern kitchens used extensively in interiors. CO2 - Appropriate type of Partitions, Panelling as per requirements. CO3 - Various types of ceilings. CO4 - Appropriate constructional details for various furniture items. CO5 - Work out quantities of materials, estimate the cost and do the rate analysis.

S.Y. B.Voc	ADVANCED INTERIOR DESIGN –II (STUDIO) BV ID 1826	CO1 - Design and plan commercial spaces. CO2 - Identify and use appropriate materials in design. CO3 - Develop skills in primary services required for the project. CO4 - Identify and list the principles of design used in given interior layout. CO5 - Develop manual/ Auto-Cadd drafting skills.
S.Y. B.Voc	CADD-III (3 D CADD)(STUDIO) BVID 1827	CO1 - 3D interface. CO2 - Use basic modeling techniques in 3D CADD. CO3 - Convert the two dimensional drawings of plans and elevations of a building in to the three dimensional models by applying the various materials
S.Y. B.Voc	MANAGEMENT SKILLS-II(STUDIO) BV ID 1828	CO1 - Understand the duties and responsibilities of senior interior designer. CO2 - Develop the skill of supervision of work. CO3 - Develop the team management skill. CO4 - Develop generic skills in team work, making decisions, communicating and Collaborating. CO5 - Develop generic skills in managing client and vendors CO6 - Develop business development skills. CO7 - Understand to maintain the health and safety at site/workplaces.

SEMESTER V

Class	Course title	Outcome
T.Y.B.Voc	WORKING DRAWING BV ID 135	CO1: Appropriate method of construction, detailing, storage, materials, soft furnishing methods required for Beds and seating systems in residential & commercial Interiors. CO2: Various complex materials required for tables & counters as furniture items CO3: Work out the near-to-exact quantities of various materials required and do rate analysis of material & labour required to estimate the project cost of designed Interior spaces. CO4: Various modular furniture items as per requirements.
T.Y.B.Voc	PROJECT	CO1: Appreciate the importance of planning. Scheduling

	MANAGEMENT BV ID 136	and controlling resources. CO2: Calculate Project Duration CO3: Understand the importance of cost- time analysis
T.Y.B.Voc	LANDSCAPE DESIGN BV ID 137	CO1: Design and plan small scale spaces. CO2: Develop skills of landscape planning for interior and exteriors CO3: Identify and use appropriate plant species. CO4: Develop application skills in landscape services CO5: Develop knowledge about landscaping materials and tools. CO6: Design and execute small-scale landscape sites
T.Y.B.Voc	WORKING DRAWING (STUDIO) BV ID 138	CO1: Drawing and drafting of detailed furniture items and work out there estimate. CO2: Various complex materials required for tables & counters as furniture items CO3: Work out the near-to-exact quantities of various materials required and do rate analysis of material & labour required to estimate the project cost of designed Interior spaces. CO4: Various modular furniture items as per requirements. CO5: Appropriate method of construction, detailing, storage, materials, soft furnishing methods required for Beds and seating systems in residential & commercial Interiors.
T.Y.B.Voc	SPECIALITY INTERIOR DESIGING (STUDIO) BV ID 139	CO1: Design and plan commercial spaces. CO2: Develop skills in planning of commercial spaces. CO3: Identify and use appropriate materials in design. CO4: Develop skills in primary services required for the project. CO5: Identify and list the principles of design used in given interior layout. CO6: Develop manual/ Auto-Cadd drafting skills.
T.Y.B.Voc	SEMINAR-II (STUDIO) BV ID 140	CO1: Develop skills to communicate the problems and solutions. CO2: Develop analyzing and troubleshooting abilities. CO3: Develop skills to prepare reports. CO4: Develop presentation skills. CO5: Understand and Implement recent developments in design fields.

SEMESTER VI

Class	Course title	Outcome
T.Y.B.Voc	PROJECT AND THESIS	CO1: Develop the ability to relate the theoretical knowledge acquired during lectures to dissertation.

	BV ID 141	CO2: Develop abilities to search information CO3: Collect data, information from various resources CO4: Develop knowledge about design. CO5: Develop knowledge about tools of interior design based on anthropometry, Aesthetical, Functional & Technological aspects. CO6: Implement the process of Design. CO7: Develop knowledge about project management.
T.Y.B.Voc	PROFESSIONAL PRACTICE BV ID 142	CO1: The main objective of the professional practice is to expose the students to practical field of the design & execution, to learn practical application of knowledge acquired to platform understand that he has prepared only a good base & that education is a continuing learning process throughout the carrier on which is about to embark. CO2: Develop the ability to relate the theoretical knowledge acquired during lectures to practical activities. CO3: Develop generic skills in team work, making decisions, communicating and collaborating. CO4: Gain first-hand experience in aspect of site visits related to interior design profession. CO5: Develop observational and analytical skills. CO6: Develop communication and presentation skills. CO7: Develop professional ethics and code of conduct.

Department of Journalism and Mass Communication

After successful completion of two years post degree Masters program in Journalism and Mass Communication a student should be able to	
Program outcome :	
1.	Understand the basic concepts of communication, its purpose and effects.
2.	Understand news, its purpose and importance.
3.	Create general awareness about societal, environmental, historical and political happenings.
4.	Create awareness about the responsibility and role press plays in democracy
5.	To understand the role played by press during British rule in creating awareness about bringing social change and swarajya.
6.	Think scientifically about the mass communication process and be able to do scientific research in Communication and Journalism
7.	To understand his responsibility as a media person to the society
8.	To understand the role media plays in building the nation, its wellbeing and development.
9.	To be able to find the discrepancies and question them and if need be raise a voice
10.	To be able to rationally think in terms of benefit of society

Program Specific outcome	
1.	To hone the journalistic and research skills through practical work, assignments, project reports, seminars, workshops and to acquaint students with advanced journalism and media practices.
2.	To fully acquaint students with the need to maintain an even balance practical, theoretical and conceptual aspects of media professions and lend them a critical understanding of the communication package as a whole.
3.	To offer appropriate grounding in the issues, ideas and challenges of 21st century thereby broadening the world view of the future media practitioners
4.	To develop multi-tasking skills required in the dynamic multi-media and convergent environment

Program Specific outcome **MJMC Part I** **Semester I**	
CJ 101 Language skills for media	• Language being a basic tool for a media person – to help student to look at language more consciously and use it more responsibly • To improve students' written, spoken and aural language skills • To help understand language development and related grammatical aspects
CJ 102 News Reporting and	• To understand the purpose and importance of news. 1. To understand the qualities of news vis a vis accuracy, clarity ,

Writing (1)	objectivity, balance, directness etc 2. To be able to write news reports for cross platform. 3. To help understand nose for news 4. To know importance of 5 W's and 1 H and 'what next' 5. Reporting under deadline pressure
CJ 103 News Editing (1)	• Learning the working of a newsroom and organization of newspaper office • To learn copywriting and editing • To plan a newspaper edition using softwares like PageMaker and Photoshop • Learn photojournalism along with ethics • To be able to design a newspaper layout and learn different techniques
CJ 104 Feature writing (1)	• To be able to write different types of leads and intros for features • To be able to use tools and techniques to write features • To be able to do research for writing for feature • Should be able to create sources, use primary and secondary sources of information for feature article.
CJ 105 World view: Issues, ideas and challenges (1)	• Joining the dots – to learn socio-political and cultural ideas and trends which homogeneously shaped the identity of Maharashtra and people. • Tobe able to conduct panel discussion on current topics • To be able to write analytical pieces about current happenings in the fields of politics, education, science and technology, culture , sports etc at state , national and international level. • To learn the making of modern Maharashtra • To be able to read newspaper objectively and analytically
CJ 106 Practical work (1)	• To be able collect information , write it in the form of news, edit it proof read it, design the newspaper, do photography for the newspaper , edit and use the photo in newspaper, and publish it • Learn photography and also learn editing it • Learn Marathi / English typing • Using of page layout and designing software like PageMaker and Photoshop • Learn to make powerpoint presentations and also learn to give presentations in front of audiences • To visit various media houses in order to know their functioning, role and responsibility.
• Program Specific outcome • MJMC Part I • Semester II	

CJ 201 News Reporting and Writing (2)	• To be able to differentiate between news, and learn about different types of news beats • To be able to do follow up stories and advanced write-ups • To be able to learn planning and team work • Learn about the changing news values • Learn interview techniques, and its types • To be able to study and analyse investigative stories
CJ 202 News Editing (2)	• To learn the concept of convergent news room • To be able to work in a convergent news room • Should be able to do advanced exercises in photojournalism • To understand the role of creative subeditor , its responsibilities • To learn coordination amongst the different departments of newspaper
CJ 203 Feature Writing (2)	• To learn the importance of editorial page and oped page and the role it plays • To be able to write editorials, columns and articles • To be able to plan and work for the supplements • To be able to multitask for multi-media • To be able to review books/ films •
CJ 204 World view: Issues, ideas and challenges (2)	• To understand the basic concepts in various spheres like state, nationality and modern nation state, liberty, equality, justice etc • To understand south Asia and colonial background • To be able to correlate various isms with current happenings • To be able to give presentations on current happenings covering all angles
CJ 205 Trends in Journalism	• To learn the history and its importance with respect to todays' journalism • To understand the changing trend in local and English language journalism • To be able to correlate between complex social life and its imprint in media • To understand the emergence of fourth estate
CJ 206 TV Journalism (1)	• To understand TV as a medium, its strengths and weaknesses, its evolution • Learn camera movements, its strengths and shortcomings • Understand sound, light and colour • To understand TV news, values, significance and timeliness • To learn working of a news room • To do tv reporting, and to learn interview skills with respect to

	tv • To be able to present news and be camera friendly •
CJ 207 Radio Journalism (1)	• To understand Radio as a medium, its strengths and weaknesses, its evolution • To be able to write for the ear • Understand sound, voice and silence and its role in aural communication • To understand radio news, values, significance and timeliness • To learn working of a radio • To do radio, and to learn interview skills with respect to radio • To be able to write scripts for radio • To understand different types of radio •
CJ 208 New Media (1)	• To understand internet, its spread, salient features and advantages over traditional media • To learn and understand online journalism, risks involved, responsibility, copy right and plagiarism • To understand digital story telling • To learn the importance of verification of facts • To be able to write blogs, individual as well as in groups • To be able to bring out a web editiiion of experimental journal
CJ 209 Practical work (2)	• To do internship in print media / news paper office for a month and get hands on experience of working of a newspaper • To bring out a news bulletin for at least one medium from TV / Radio/ New Media

Program Specific outcome MJMC Part II Semester III	
CJ 301 Communication : Theory and Practice	• To understand media as a important social institution , to understand the concept of Mediation • TO understand the role and functions of Media • To understand media's structure and organization, its economy, ownership and control • To be able to charactarise media content into its different genres. • To understand convergence – its conceptual frame work technological, economical , socio-cultural dimensions • Understand Audience and media effects • To understand political communication
CJ 302 Media	• To understand what research is, its history, relevance and nature

Research Methods	of media research • To be able to understand qualitative and quantitive forms of research, utility and process • To understand sampling and importance of scaling in media studies • To understand the concept of research design
CJ 303 World view: Issues, Ideas and Challenges (3)	• To learn about Global Politics 1. To understand the role and functions of various international actors like UN, IMF World Bank etc 2. To get to know about major issues like globalization, capitalism, international conflicts like war, ethnicity or fundamentalism, terrorism human rights etc
CJ 304 TV Journalism (2)	• To learn advanced techniques of interviewing • Learn What a TV documentary is, its formats types and nature • To understand Working of TV news channel and its management • To understand the impact of TV on society
CJ 305 Radio Journalism (2)	• To learn the production technology and software used for audio recording and editing • To understand the working of radio stations and All India Radio • To understand various radio formats • To learn radio advertising
CJ 306 New Media (2)	• To be able to see new media as an alternative form of journalism • To understand the changing role of e-journalism and its participatory nature • To learn about social activism • To learn ethics of web journalism
CJ 309 Environmental Journalism	• To understand the concept of environment, its perspectives, global and local issues. • To understand advocacy for environment Journalism • To understand why and how of global warming, reporting climate change • To be able to do analysis of environment news in media • To be able to do reporting and writing analytical pieces on environment
CJ 311 Practical work (3)	• To do internship in either TV or Radio or New Media and get hands on experience of reporting and editing etc for this media • To be able to prepare a specialized or general subject magazine • To visit various organizations , institutions' and government bodies in order to understand their role and functioning

Program Specific outcome MJMC Part II Semester IV	
CJ 401 Media Management	• To understand the contemporary media scenario and also to learn about its proliferation • To learn about the ownership patterns and its effect on the business of newspapers, TV, radio and new media • To learn about the management of all theses media types
CJ 402 Principles of Journalism and Media Laws	• To understand what Journalism is with respect to theories. • To get to know ethics and its importance and its application. • Learn about the constitution of India and how it has to be followed while communicating with the masses • To learn about media laws • To be able to study various cases related to media and also learn about media trial •
CJ 403 World views : issues, ideas and challenges (4)	• To learn about politics in India and Maharashtra – electoral politics, communalism, casteism, etc – challenges and solutions • To be able to go beyond the news and look for news behind the news • To be able to generate views beneficial for the society at large
CJ 404 Advertising	• To understand the basic concept of advertise and its function as mass communication • To study advertise as marketing communication • To learn about copy writing for advertise • To be able to analyse social effects of ads • To be able to understand the functioning of an ad agency
CJ 405 Public Relation	• To understand the difference between advertise, PR, propaganda • To understand the concept of PR • To understand the concept of 'communication audit • To learn about types of PR and PR tools • To understand media relations as PR function • To be able to prepare PR plan for an organization • To be able to evaluate media publicity • To be able to write press release '
CJ 410 Law, order and crime Journalism	• To understand the basic concept of crime, ethics and laws • To learn about law enforcement machinery • To learn about how crime is covered, and reported for cross media platforms

	• To understand the importance of crime reporting in newspapers • To study the impact of crime reporting • To learn about trial by media • To be able to do analysis of crime news in various media
CJ 413 Dissertation	• To be able to apply the concepts learned in research methodology to problems related to media • To be able to do research with scientific method • To be able to analyse the results • To be able to apply proper statistical methods • To be able to present data using appropriate graphs
CJ 414 Indepth reporting	• To be able to dig deep into topics of considerable social significance and current relevance • To be able to write reports on these topics • To be ableto use primary and secondary sources of information • This will inculcate in getting information from sources and communication it to masses

Department of Electronic Science

Program outcome : B.Sc. Electronic Science	
After successful completion of three year degree program in Electronic Science a student should be able to	
Program outcome : B.Sc. Electronic Science	PO1: Student acquire adequate knowledge of Analog systems design, digital system design, communication systems, basics of nanotechnology, nanoelectronics.
	PO2: Student design and test Analog and design digital system
	PO3: Student learns various methods to analyse working of systems
	PO4: Students learn the applications of various circuit blocks
	PO5: Student learn some consumer products block diagrams, working and specifications,
	PO6: Students write the program in C language and uses MATLAB tool to solve different task
	PO7: Students acquire more practical knowledge and circuit building skill by completing their project.
	PO8:Use modern techniques, equipments, devices and software's to design, develop and test their projects

Program outcome : M.Sc. (Electronic Science)	
After successful completion of two year degree program in Electronic Science a student should be able to	
Program outcome : M.Sc. (Electronic Science)	PO1: Student acquire adequate knowledge of Mathematical methods to analyse Analog, digital systems.
	PO2: Students performed experiments using optical fiber communication systems.
	PO3: Student design and test Analog and design digital systems
	PO4: Students learn the applications of various circuit blocks
	PO5: Student learn some consumer products block diagrams, working and specifications,
	PO6: Students write the program in c language and uses MATLAB tool to solve different task
	PO7:Use modern techniques, equipments, devices and software's to design, develop and test their projects
	PO8: Students acquire more practical knowledge and circuit building skill by completing their final year project.

Program Specific outcome : B.Sc. (Electronic Science)	
Program Specific outcome : B.Sc.	PO1: Gain the knowledge of Electronics through theory and practical's.
	PO2: Students design, build, test and explain the working of electronic analog and digital circuits.
	PO3: Students learn the analysis using different theorems.

(Electronic Science)	PO4: Learn Analog, Digital communication, Communication systems and communication technologies.
	PO5: Learn sensors, transducers, instrumentations, optical fiber system..
	PO6: Make aware and handle the sophisticated instruments/equipments

Program Specific outcome :M.Sc. (Electronic Science)	
Program Specific outcome :M.Sc. (Electronic Science)	PSO1: Gain in depth understanding various aspects of the Electronics through theory and practical's.
	PSO2: Acquired the working principles, design guidelines and experimental skills associated with different semiconductor devices and circuits.
	PSO3: Understood the mathematical and analysis techniques, electromagnetic and instrumentation principles.
	PSO4: Learn the design methodologies for digital and embedded systems
	PSO5: Students aware of theory and practicals of communication electronics, Digital signal processing and control systems.
	PSO6: Learned Antenna parameters, Antenna softwares, Microwave and satellite communications, various applications software, circuits and systems.
	PSO7: Learned Human right, Robotics skill development courses.
	PSO8: Students completed application oriented projects using different microcontrollers and using different softwares (XILINX, C, MATLAB, AVR, PIC) which developed research oriented skills.
	PSO9: Students were acquired information of PLD, CPLD, FPGA and their applications.
	PSO10: Students handle the sophisticated instruments/equipments

Course Outcomes of BSc. (Electronic Science) Annual

Class	Course title	Outcome
FYBSc (Paper-I)	EL-101: Principles of Analog Electronics	CO1: Students are able to understand importance of Electronics in day today life CO2: Student could identify different parameters/functions/specifications of components used in electronic circuits CO3: Students are able to solve problems based on different laws and network theorems. CO4: Students performed simulations using simulator for analyzing network performance CO5: Student aware of basics of Semiconductor Devices-Diode, Transistor, MOSFET etc. CO6: Students are able to build and test the circuits like street light controller using electronic devices CO7: Students are able to know basics of operational amplifier and opamp applications. CO8: Students get familiar with operating principle of IC 555 and types of DAC/ADC and their performance .

FYBSc-(Paper-II)	EL- 102: Principles of Digital Electronics	CO1: Student studied different number systems and codes CO2: To understand logic gates and truth tables CO3: Students are able to understand combinational logical circuits and sequential logical circuits. CO4: Students are able to reduce the expression using Boolean theorems CO5: Students get familiar with applications of counters like ring counter or event counter CO6: Student acquired the skill to design the UP/DOWN counters. CO7: Student get familiar with different integration technology and logic families.
FYBSc-(Paper-III)	EL-103 Practical	CO1: Students are able to identify different components and devices as well as their types CO2: Understood basic parameters associated with device-diode, transistor. CO3: Studied the operation of different instruments used in the laboratory CO4: Student could connect circuit and did required performance analysis CO5: Students learn amplifier, rectifier experiments. CO6: Acquired knowledge of basic logic gates, derived logic gates, interconversion. CO7: Learn half adder, full adder, half substrctor etc logic circuits. CO8: Students are ready to assemble analog and digital circuits using bread board.

Course Outcomes of BSc. (Computer Science): Annual

Class	Course title	Outcome
FYBSc (Paper-I)	EL-101:Paper-I Principles of Analog Electronics	CO1: Students get familiar with basic circuit elements and passive components. CO2: Student understood DC circuit theorems and their use in circuit analysis. CO3: Student studied various active components. CO4: They studied elementary electronic circuits. CO5: Students studied semiconductor materials. CO6: Students studied various semiconductor devices & their characteristics. CO7: Students studied operational amplifier basic & application.
FYBSc-(Paper-II)	ELC 102: Principles of Digital	CO1: Familiar with concepts of digital electronics CO2: Learned number systems and their representations CO3: Understood basic logic gates, Boolean algebra and K-

	Electronics:	maps CO4: Studied arithmetic circuits, combinational circuits and sequential circuits CO5: Students are able to design digital circuit designed CO6: Student are able to make short projects on digital electronics circuits
FYBSc-(Paper-III)	ELC 103: Practical	CO1: Students are able to connect opamp circuits and analyzed the output CO2: Studied application circuits of opamp CO3: Student designed the IC 555 as astable/monostable multivibrator. CO4: Students are able to compare simulated and actual results of given circuit. CO5: Students get familiar with various instruments & components in the LAB. CO6: Conducted small practical competitions during practical sessions, has improved skills of students.

Course Outcomes of BSc. Electronic Science: Semester I

SYBSc-(Paper-I)	EL211: Analog Circuit Design	CO1:Understand the working of various analog circuits and frequency response of analog circuits CO2: Know about the various types of amplifier like Voltage amplifier, power amplifier and multistage amplifier , and its applications like PA System CO3: Know the concept of feedback, concept of feedback amplifiers and their characteristics and applications CO4: Design the different oscillator circuit. CO5: Applications of Operational Amplifiers like Adder, Subtractor, Integrator, Differentiator, Log amplifiers , Comparator etc
SYBSc (Paper-II)	EL212: Digital Circuit Design	CO1: Develop a Digital logic and apply it to solve real life problems. CO2: Analyse, Design and implement combinational logic circuits like Adder, Subtractor, Parity generator, magnitude comparator. CO3: Analyse, Design and implement sequential logic circuits like Counters, shift registers etc. CO4: Use of k-maps in the design of combinational circuits. CO5: Understand the design and working of various data converters 4CO6: Applications of counters like Auto-parking System, totalizer , Digital clock, bank token display CO7: Interfacing of LED's, single and multi digit 7 segment display/ driver, Switches, Keypad, Thumb, wheel switches

		with digital systems

Course Outcomes of BSc. Electronic Science: Semester II

SYBSc (Paper-I)	EL221: Electronic Instrumentation	CO1: Students can design Volt meter, Current meter, Ohm meter, multi-range meters, multi-meter, AC Voltmeter. CO2:Use of signal generation for testing various communication and instrumentation circuits, fault finding in the circuits CO3: Students design various sensor based instruments like PH meter, energy meter, digital thermometer, Lux meter etc. CO4: Students can manufacture different types of power supplies.
SYBSc (Paper-II)	EL222: Communication Electronics	CO1: Understand different blocks in communication system and how noise affects communication system using different parameters. Block diagram of Telephone system. CO2: Distinguish between different modulation schemes like AM, FM, PM etc. With their advantages, disadvantages and applications. CO3: Understand basics of AM and FM Receivers. CO4: Identify differet Radio receiver circuits and role of AGC CO5: Understand the digital communication system and its application like FDM,TDM,MODEM, Set Top Box etc.
SYBSc (Paper-III)	EL 203	CO1: Students use the basic concepts for building different electronic circuits.. CO2. They understand design procedures of different electronic circuit. CO3: Student able to build experimental setup and test the circuits. CO4: They acquired the skills of analyzing test results of experiments.

Course Outcomes of BSc. (Computer Science): Sem. I

Class	Course title	Outcome
SYBSc (Paper-I)	ELC 211: Digital System Hardware	CO1. To study the applications of logic gates. CO2. Students are able to design different digital circuit design using K-maps. CO3. Understands basics of microprocessors CO4. Students are able to understand fundamentals of multi-core technology.
SYBSc-(Paper-II)	ELC 212: Analog Systems	CO1. Understood basics of analog electronics CO2. Leaned different types of sensors CO3. Understood different types of signal conditioning circuits

		CO4. Studied data conversion techniques CO5. Now can apply knowledge of analog systems in different applications

Course Outcomes of BSc. (Computer Science): Sem. II

Class	Course title	Outcome
SYBSc (Paper-I)	ELC 221: The 8051 Architecture, Interfacing & Programming	CO1. Studied the basics of 8051 microcontroller CO2. Students are able to study the Programming and interfacing techniques of 8051 CO3. Students are able to apply knowledge of 8051 to design different application circuits CO4. Studied basic concepts of advanced Microcontrollers.
SYBSc- (Paper-II)	ELC 222: Communication Principles	CO1. Understood basics of communication systems. CO2. Understood modulation, demodulation and multiplexing of signals. CO3. Learned digital communication techniques CO4. Familiar with concepts in advanced wireless communication.
SYBSc- (Paper-III)	ELC-203: Practical Course	**CO1:** Students developed basic concepts for building various applications in electronics. CO2: Understood design procedures of different electronic circuits as per requirement. CO3: Students learned to build experimental setup and test the circuits. CO4: Developed skills of analyzing test results of given experiments.

Course Outcomes of BSc. Semester I

TYBSc (Paper-I)	EL331:Advanced Digital System Design	CO1: Student studied the Verilog HDL Code of different digital system CO2: They could design different combinational and sequential circuits CO3: Student studied the PLDs and its applications.
TYBSc (Paper-II)	EL332: Microcontrollers	CO1.student learnt architecture of 8-bit microcontroller. CO2. Students are able to use instruction set and addressing modes of microcontroller. CO3. student developed assembly language programming skills. CO4. Students are able to interface memory and I/O devices.
TYBSc (Paper-III)	EL333: Analog Circuit Design and Applications of ICs	CO1: Students study the practical design aspects while using Op-amps CO2: Learns the basic application circuits of Op-Amps CO3: Learns the specifications and selection criterion for linear ICs

		CO4: Students acquired the information about different special purpose ICs and their applications CO5: Students refer and understand data manuals.
TYBSc (Paper-IV)	EL334: Principles of Semiconductors Devices	CO1 : Students can grow the crystal on substrate CO2: They are able to understand the structure with reference to semiconductors. CO3: Understood the theory of metal-semiconductor and p-n junctions CO4: Understood the working of semiconductor devices like BJT , FETs MOSFETs etc.
TYBSc (Paper-V)	EL335: C programming	CO1. Students become familiar with fundamentals of C language, which is powerful tool in industry. CO2. Developed algorithm/flowcharts for problem solving and writing programs. CO3. They learn various tools to use functions, arrays, pointers and file handling in C language. CO4. They studied different types of algorithm. CO5. C-subject is skilled based, industrial oriented.
TYBSc (Paper-VI)	EL336: Fiber Optic Communication	CO1: understand basic laws of optical communication and working of various types of optical components. CO2: Understand FOC link structure, propagation and transmission properties of OF. CO3: Learned about various types of optical sources, detectors and fiber types and their suitability/ choice for any applications. CO4: Estimate the losses and analyze the propogation characteristics of an optical signal in optical fiber. CO5: Design FOC link based on budgets. CO6: Learned about different optical test instruments.

Course Outcomes of BSc. Semester II

TYBSc (Paper-I)	EL341: Advanced Communication Systems	CO1: Student studied the various types of antenna and its parameters CO2: They could identify the AM and FM transmitter and receiver. CO3: Student studied the digital modulation techniques like ASK, FSK, Delta modulation, QPSK,QAM.
TYBSc (Paper-II)	EL342: Microcontroller and its Applications	CO1: Student used 'C' language for programming the microcontrollers CO2: Learnt to use Timers, Interrupts and Serial Communication in Microcontroller. CO3: Student are able to apply the knowledge in real world applications
TYBSc	EL343: Power	CO1: Students learns the basics of power electronics and

(Paper-III)	Electronics	familiar with Power Electronic Devices, circuits and applications CO2: Learns about power devices and protections of devices. CO3: Learns various types of power circuits such as rectifiers using thyristers, Inverters, Converters etc. CO4: Learns the applications of power electronics
TYBSc (Paper-IV)	EL344: Foundations of Nanoelectronics	CO1: Understood the concept of cyclotron and its use CO2: Understood the Hall effect and use of to find the types of semiconductor. CO3: Understood the Use of Maxwell's Equations and laws of Electrodynamics, Equation of continuity, Pointing vector theorem. CO4: students know how to find energy transferred from sun to earth.
TYBSc (Paper-V)	EL345: Mathematical Methods and Circuit Analysis using MATLAB	CO1. MATLAB is powerful scientific engineering tool for various designing. CO2. Students learned features of MATLAB as a programming tool. CO3. MATLAB used to promote new teaching model, which is used to develop programming skills and technique to solve mathematical problems. CO4. Revision of Laplace Transform and Fourier series and its applications. CO5. Students introduced with MATLAB as a simulation tool. CO6. MATLAB is skilled based, industrial oriented
TYBSc (Paper-VI)	EL346: Industrial Automation	CO1: Identify the various parameters that are measurable in electronic instrumentation. CO2: Select appropriate passive/active transducers and ac and dc bridges for relevant physical parameter measurement CO3: Get complete view of strategies for process control and process automation. CO4: Understand the terms like Process Characteristics: Process equation, Process load, Process lag, self regulation CO5: Understand Control system parameters: Error, Variable range, control parameter range, control lag, dead time, cycling.
TYBSc (Paper-VII)	EL347: Practical -I	CO1:Students referred the various datasheets of the electronic devices and integrated circuits CO2: They learnt how to select the devices, sensors, actuators and ICs for a particular application CO3: Developed the basic skills required to handle the various instruments CO4. Students acquire designing skill of analog and digital

		circuits/ systems
TYBSc (Paper-VIII)	EL348: Practical -II	CO1. Student learnt the basic C-Programming & Verilog HDL to design basic combinational and sequential circuits CO2. Student get familiar with structural, data flow and behavioural modelling CO3. Student learnt assembly level language of 8051 microcontroller CO4. They used cross compiler to develop C-programs for microcontroller CO5. Student studied the various interfacing circuits to 8051 microcontroller
TYBSc (Paper-IX)	EL 349: Project course (Practical)	CO1: Students developed projects related to Robotics, sensor based Pollution parameter measurements. CO2: Students designed and developed projects using MATLAB tools. CO3: Students participated in different project competitions.

Course Outcomes of M.Sc (Electronic Science): Semester I

Class	Course title	Outcome
MSc.-I	EL1UT01: Mathematical Methods in Electronics and Network Analysis	CO1: Students got familiar with role of differential equations in applied electronics CO2: Student learnt the mathematical tools and techniques for network analysis CO3:Studied the methods of analysis for CT and DT signals and systems CO4: Learned concept of mathematical modelling of simple electrical circuits.
MSc.-I	EL1UT02: Analogue Circuit Design	CO1: Acquire a basic knowledge in solid state electronic devices like diode, BJT, MOSFET etc. CO2: Learned the characteristics and working of electronic devices CO3: Understand the wideband and narrowband amplifiers using BJT CO4. Developed the ability and skills in analysis and design of analog circuits CO5: They Studied the designs of Opamp applications such as integrator, differentiator
MSc.-I	EL1UT03: Digital System Design	CO1. Student understood sequential and combinational logic design techniques CO2. They get aware of VERILOG HDL CO3.Student learnt various digital circuits using VERILOG CO4. Studied PLD, CPLD, FPGA and their applications
MSc.-I	EL4UT04: Advanced 'C'	CO1: Students are understood basic concepts of C programming language.

	Programming	CO2. Students are learned various advanced features, graphics and interfacing CO3: Students are learned concepts of object oriented programming in C++
MSc.-I	EL1UP01: Practical course -I	CO1: Students acquire the skill of designing different analog circuits such as Tuned amplifier, Bootstrap ramp generator etc CO2: Learned to design Instrumentation amplifier for a given gain. CO3: Designed and tested Multiplexed display used for Bank token / two digit counter CO4: Learned the code conversion from binary to gay and vice-versa. CO5: Students learned to generate Waveform using quadrature oscillator, Bubba oscillator.
MSc.-I	EL1UP02: Practical course -II	CO1. understood design and implementation of sequential and combinational logic design techniques CO2. Student able to perform VERILOG HDL coding CO3. They learnt various digital circuits using VERILOG CO4. Studied PLD, CPLD, FPGA and their applications CO5: Learned Phase and frequency response from transfer function of a CT system: Low Pass and High Pass, Phase and frequency response from transfer function of a DT system: Low Pass and High Pass CO6: Learned transient and steady state response of CT system: LCR series circuit with different inputs CO7: Simulation of transfer function using poles and zeros and Synthesis of periodic waveform from Fourier coefficients.
MSc.-I	EL1UP03: Practical course (PLE) -III	CO1: Students selected small projects -Project like experiments (PLE). CO2: Students designed, assembled/PCB circuits, and tested the project. CO3: Students prepared the PLE report in bound form. CO4: Students presented their PLE using PPT presentation. CO5: Students demonstrated their PLE to faculty members 2/3 times and also demonstrated to external examiner.

Course Outcomes of M.Sc (Electronic Science): Semester II

Class	Course title	Outcome
MSc.-I	EL2UT05: Applied Electromagnetics, Microwaves and Antennas	CO1. Student get familiar with the concepts of electromagnetic CO2. They understood the theory of transmission lines and wave guides CO3. Student studied various parameters of antennas

		CO4. Student get aware of various methods of generation of microwaves
MSc.-I	EL2UT06: Instrumentation and Measurement Techniques	CO1. Understand the configurations and functional descriptions of measuring instruments. CO2: Understand the basic performance characteristics of instruments CO3: Identify the various parameters that are measurable in electronic Instrumentation. CO4: Select appropriate passive/active transducers and ac and dc bridges for relevant physical parameter measurement. CO5. Understand the working principles of various types of sensors and transducers and their use in measuring systems.
MSc.-I	EL2UT07: Embedded System Design	CO1: Understand the basics of embedded system CO2: Understood the architecture, assembly language and interfacing of different 8-bit microcontrollers. CO3:Learned embedded C programming CO4:Learned software techniques to embed codes in to the systems CO5: Learned communication standards and protocols
MSc.-I	EL2UT08: Foundation of Semiconductor Devices	CO1: Students understood crystal structure with reference to semiconductors. CO2: They able to grow the crystal on substrate. CO3: They understood quantum and statistical mechanics CO4:understood the characteristics of various semiconductor devices CO5:understood the working principle of diode, transistor and FETs CO6: Students know the importance of Modern BJT structures like polysilicon emitter BJT, Heterojunction bipolar transistor.
MSc.-I	EL2UP04: Practical course -IV	CO1: Student familiarized with Instrument and Measurement System. CO2: Student studied various parameters of antennas CO3: Studied the operation of different instruments used in the laboratory CO4: Student could connect circuit and did required performance analysis.
MSc-I	EL2UP05: Practical course -V	CO1: Students learned to generate Waveform using PIC/AVR microcontroller. CO2: Student learned to interface LCD, LED array with PIC/AVR microcontroller. CO3: Student learned to interface Event counter with PIC microcontroller. CO4: Student learned to interface Event counter with PIC

		microcontroller. CO5: Student learned to interface stepper motor with AVR microcontroller.
MSc-I	EL2UP06: Practical course (PLE) -VI	CO1: Students selected small projects -Project like experiments (PLE). CO2: Students designed, assembled/PCB circuits, and tested the project. CO3: Students prepared the PLE report in bound form. CO4: Students presented their PLE using PPT presentation. CO5: Students demonstrated their PLE to faculty members 2/3 times and also demonstrated to external examiner.

Course Outcomes of M.Sc (Electronic Science): Semester III

Class	Course title	Outcome
MSc-II	EL3UT09: Communication Electronics	CO1: Students studied mathematical representations of Amplitude and frequency modulation. CO2: Students acquire knowledge of noise, types internal and external, noise figure, and superhero dyne receiver. Knows the FDM and TDM systems CO3: Learn the different digital modulation techniques: Delta, Adaptive delta, ASK, FSK,PSK, QPSK, QAM etc. CO4: Students studied different types of antenna's, antenna parameters and different atmospheric layers and electromagnetic wave propagation. CO5: Students aware of satellite communication, fiber optic communication, 3G, 4G, SDLC, HDLC, VSAT etc.
MSc-II	ELDT02: Advanced Embedded Systems	CO1. Studied the architecture of Advanced RISC machine (ARM7) CO2. Learned assembly level programming of ARM-7 and interfacing hardware CO3. Acquainted to fundamentals of operating system CO4. Students familiar with real time operating system (RTOS) CO5. Learned RTOS in detail
MSc-II	ELDT12:Nano-Electronic Devices	CO1: Students understood basics of quantum and statistical techniques CO2: They able to grow the Nano-materials on substrate. CO3: Understand the characterization techniques of nano-materials CO4: They aware with nano-materials and nano-structured devices like DNA computers, Tunnelling diode, MEMs, ROBOTs, RAM, Flash memory etc.
MSc-II	ELDT12: Digital	CO1:This course helped to provide a background of signals, their characteristics and mathematical representations and

	Communication	noise in signals CO2: Students are well aware of various digital modulation techniques CO3: Students are studied concept of information and coding theory in digital communication CO4: Students are also aware of different coding systems used in Digital communication
MSc-II	EL3UP07:Practical Course – VII	CO1: Students acquire the skill of designing different (FM, ask etc) transmitter/ receiver system in Communication Electronics CO2: Learned Signal conditioning circuits for analog controller CO2: They able to Design and implement ON-OFF Controller P/PI/PID controller CO3: They able to controlled the Motor speed using PWM. CO4: Students understood the concept of Optical fiber and data send through it.
MSc-II	EL3UP08:Practical Course – VIII	CO1**:** Students are understood programming Of ARM microcontroller CO2:Students learned the programming of MATLAB CO3:students are understood the ARM interfacing with LCD, DAC, ADC CO4:students are aware of different Communication techniques with help of MATLAB CO5:Students are understood the different concept of signal and image processing
MSc-II	EL3UP09:Practical Course (PLE) –IX	CO1: Students selected small projects -Project like experiments (PLE). CO2: Students designed, assembled/PCB circuits, and tested the project. CO3: Students prepared the PLE report in bound form. CO4: Students presented their PLE using PPT presentation. CO5: Students demonstrated their PLE to faculty members 2/3 times and also demonstrated to external examiner.

Course Outcomes of M.Sc. (Electronic Science): Semester IV

Class	Course title	Outcome
MSc-II	EL4UT10: Control Systems	CO1. Student got familiar with basic concepts of control theory CO2. Understood different control strategies CO3. Developed problem solving attitude CO4. Imparted information about control instrumentation CO5. Students got familiar with latest trends in industrial control / production systems

MSc-II	ELDT16: Computational Methods for Electronics	CO1: Students learned different statistical techniques. CO2: Students used MPLAB tool for solving algebraic and quadratic equations CO3:MPLAB used for circuit analysis CO4: Students learned numerical methods (Bi-section, Newton-Raphson, Secant). CO5: Students solves the problems of Interpolation, ordinary and partial differential equations. CO6: Student acquires the knowledge of curve fitting techniques.
MSc-II	ELDT01: Advanced Power Electronics	CO1.Student studied the basic principles and applications of power electronics CO2. They understood the solid-state devices required for power electronic circuits CO3. Student studied and understood the power conversion and power transmission principles CO4. They could understand industrial and domestic applications
MSc-II	ELDT03: Digital Signal Processing	CO1: Studied fundamental aspects of Digital Signal Processing (DSP) CO2: Student became aware of mathematical background required for DSP CO3: learnt design of digital filters and implementation on digital Signal Processor CO4: Studied DSP applications
MSc-II	EL4UP10: Practical Course –X (Project)	CO1: Students selected project as per their interests based on microcontroller, sensor, wireless etc for 200 marks. CO2: Students study the research papers and find idea or think of society useful applications. CO3: Students gave the PPT presentation of block diagram to faculty members for final topic selection. CO4: They designed, assembled/PCB circuits, and tested the project. CO5: Students prepared the project report in bound form. CO6: Students take guidance of their project from faculty members and guide. Even they interact with other department faculty members. CO7: Students demonstrated their PLE to faculty members 2/3 times and also demonstrated to external examiner.

Department of Physics

Programme	Name of the Subject	Outcomes of Programme
F.Y.B.Sc	Practical	A practical physics course should enable students to do experiments on the fundamental laws and principles, and gain experience of using a variety of measuring instruments. Practical work enhances basic learning skills.
F.Y.B.Sc	Mechanics and properties of matter	To make students aware of importance of mechanical properties of the material To make student capable to find Surface tension, Elasticity & viscosity related properties of the material .
F.Y.B.Sc	Heat and Thermodynamics	To make student aware of heat as a form of energy, Study the heat related properties of material and understand thermal conductivity of the material, Study mechanism of Diesel engine and Otto engine.
S.Y.B.Sc	Practical	Physics deals with the understanding of natural phenomena and applying this understanding to use the phenomena for development of technology and for the betterment of society
	INTSRUMRNTATION	Industrial automation and industrial instrumentation are required to control various operations in industries.
	Optics	1. Describe and discuss waves, colour, frequency, photon energy, phase difference, optical coherence and coherent sources using monochromatic light sources of light 2. Describe and discuss optical interference observed using wavefront splitting and amplitude splitting interferometers optical antireflection coatings 3. Describe and discuss linear, circular and elliptical polarisation and methods to used to generate and analysis polarised light using wave plates. Outline stress Birefriengence and use of polarised light 4. Describe and discuss diffraction effects observed in a single slit and circular aperture and relate to Rayleigh criterion and optical resolution. 5. Derive and manipulate formula and perform fundamental numerical calculations to solve physical optics problems related to waves, polarisation, interference and diffraction phenoneoma Learning Outcomes (LO): On Completion of this laboratory component, the learner will be able to; 6. Investigate and prove fundamental geometrical

		optical relationships encountered in lecturers.
T.Y.B.Sc	Atomic & Molecular Physics	Students learn about atomic spectrum, molecular spectra, Zeeman effect, Raman spectra & starck effect. There topics helps the students to understand spectroscopic techniques for quantative & qualitative analysis of materials.
T.Y.B.Sc	Quantum Mechanics	Students learn about origin of quantum mechanics wave function ,Probability density, Schrödinger's equations, applications of Schrodinger's equation, and operators in quantum mechanics. This knowledge helps the students to solve the problem in physics by applying quantum theory.
	Renewable Energy Sources	Trillions MW energy requirement cannot be fulfil with conventional energy sources. There is finite requirement to find the alternative non-conventional energy sources. In this course we studied the various forms of the non-conventional energy sources. Various ways by which we can utilise those sources to fulfil our daily energy need.
T. Y. B. Sc	Classical Electrodynamics	Behaviour of the charge particle in electrostatic as well as magnetostatis gives the new era in physics. The basic laws of electrostatics and magnetostatics used to solve the complicated problems in electrodynamics. Behaviour the field can be used to derive the Maxwell's equation. Using Maxwell's equation can be used for many applications like radar as well as communication purpose.
	Thermodynamics and Statistical Mechanics	Students can understand different thermo dynamical systems and compute the different terms related to heat and thermodynamics .They can understand connection between microphysics and thermodynamics and statistical mechanics. The understanding of why and when the classical approach to thermo dynamical systems fails gets cleared. Difference between M-B, B-E, and F-D statistics can be understood.
	Electronics	Industrial automation and motion control, Machine learning, motor drive control, Mechatronics and robotics, Power converting technologies, Photo voltaic systems, Renewable energy applications, Power electronics, and Biomechanics.
	Mathematical Methods	The application of mathematics to problems in physics

	in Physics	and the development of mathematical methods suitable for such applications and for the formulation of physical theories
	Advanced Electronics	The process in which assembly of several electrical, measuring and control instruments interconnected for measuring, analyzing and controlling the electrical and non-electrical physical quantities in Automation & Process Control Industry
T. Y. B. Sc	Nuclear Physics	Students get Knowledge about different reactors useful in BRC and Radiation therapy for cancer treatment
	Classical Mechanics	Students can have deep understanding of Newton's laws. Be able to solve Newton's equations for simple configurations using various methods. Understand the foundation of chaotic motion. To study the basics of Hamiltonian and lagrangian systems.
T. Y. B. Sc	Computational Physics	Students get knowledge about C programming useful to design and development of varies program to control the operation of different machines
T. Y. B. Sc.	Solid state Physics	1- Students will be able to analyze different types of matter depending on nature of chemical bonds and their properties 2- Students will be able analyze the crystal structures by applying crystallographic parameters. 3- Students will be able to determine the crystal structure by analysis of XRD data 4- Students will be able to evaluate and analyze the electrical and optical properties of solids 5- Students will be able to analyze electron transport and energy related problems by applying quantum mechanical principles 6- Students will be able to analyze the lattice vibration phenomenon in the solids 7- Students will know the fundamental principles of semiconductors, including pn-junctions, and be able to estimate the charge carrier mobility and density. 8- Students will be able to account for what the Fermi surface is and how it can be measured 9 Students will - know basic models of magnetism 10- Students will be able to outline the importance of solid state physics in the modern society.
T. Y. B. Sc.	Laser	Students will be able to

M. Sc.		• Differentiate between Fraunhofer and Fresnel diffraction • Apply skill to find the wavelength of spectral lines using Plane diffraction grating • Distinguish the methods of polarisation by reflection, refraction and scattering • Explain the Brewsters law and Malus law • Describe the different types of lasers, its principle, properties of laser beam • Classify the different types of fibre • Challenges Students should therefore gain a significantly enhanced understanding of how lasers work and which types of lasers are most relevant for specific performance specifications and subsequent applications.
M. Sc.	Statistical Mechanics	The statistical mechanics has the direct impact in the research field of high energy physics, Nuclear physics and Particles physics. Students can understand Quantum and classical mechanics for ideal systems and be able to judge when quantum effects are important They can understand connection between microphysics and thermodynamics
M. Sc.	Materials Sciences	The classify materials according to their types, Give information about atomic structure, atomic bonds, crystal structure, crystal geometry and crystal defects, Give information about all the properties of materials, Give information about solidification, crystal defects and diffusion in solids
M.Sc	Energy studies	Course enables availability and distribution of various renewable energy sources. Benefits of renewable energy and applications.
M. Sc.	Basic Physics Lab-I	Various experiments demonstrate the basic laws of physics. Various parameters which we change to study the laws. Application and theoretical background of those experiments can be used to develop the future instruments based on that.
M. Sc.	Nuclear Physics	Structure of the nuclease was the puzzle in the 18th century. Various techniques nowadays available to study the nuclear reactions. Various model developed to study the structure of the nucleus. Variety of area in which we can utilize the knowledge of radiation physics as well as nuclear physic, like, Diploma in Radiology, etc.

M. Sc.	Thin Film	The students gain experience in handling high vacuum equipment and using thin film growth techniques which to enables them to work at production units related to optical, mechanical, electronic coatings etc. They acquire range of basic knowledge and practical skills required to act as responsible for making scientific decisions and to accomplish tasks related to the development, production, processing, of coating materials and solve routine problems as well as unpredictable contexts.
M. Sc.	Special Laboratory: Thin film	On completion of the course, the student should be able to: ▪ discuss the differences and similarities between different vacuum based deposition techniques, ▪ evaluate and use models for nucleating and growth of thin films, ▪ asses the relation between deposition technique, film structure, and film properties, ▪ discuss typical thin film applications, ▪ motivate selection of deposition techniques for various applications.
	Special Laboratory: Enery- I and II	Upon completion of the course, the student will be able to: 1. Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations. 2. Know the need of renewable energy resources, historical and latest developments. 3. Describe the use of solar energy and the various components used in the energy production with respect to applications like - heating, cooling, desalination, power generation, drying, cooking etc. 4. Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications. 5. Understand the concept of Biomass energy resources and their classification, types of biogas Plants-applications 6. Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations. 7. Acquire the knowledge of fuel cells, wave power, tidal power and geothermal principles and applications.

	Special Laboratory: Nano Technology	After completing this course students will be able to: 1.Learn about the background on Nanoscience 2.Understand the synthesis of nanomaterials and their application and the impact of nanomaterials on environment 3.Apply their learned knowledge to develop Nanomaterial's.
M.Sc –I	Experimental Techniques in	students learn about sensors, signal processing, vacuum physics, vacuum measurement techniques, spectroscopic techniques such as UV-Vis, FTIR,XRD,SEM,STM,AFM,ESR, NMR,VSM,SQUID and TGA/DCA. This knowledge helps the analysis of materials in various research & technological applications.

Department of B.Voc. Printing Technology.

Department of B.Voc. Printing Technology	After successful completion of three year degree program in B.Voc. Printing Technology a student should be able to;
Programme Outcomes	During their studies, students shall learn the detailed aspects of various printing processes like Offset printing, Gravure printing, Flexography, Letterpress and Screen printing including the machineries being used. Also students shall get the subject knowledge of printing material, pre-press technologies, digital printing, Security Printing, print finishing techniques, project work, business management, entrepreneurship development, cost estimation etc. Subjects on packaging technology have been included in the curriculum to impart basic knowledge of packaging technology to enable the students to apply the same in his professional career.
Programme Specific Outcomes	On first year students shall have the knowledge of the subject on pre-press technology, offset printing process, printing material science, packaging technology with the practical aspects involved with it. On completion the first year students shall have the skill of Offset printing process and they will reach the level of Diploma in printing Technology. On second year students shall learn the subject on digital pre-press technology, Gravure printing process, Packaging technology, Computer science applicable to printing with the practical aspects involved with it. On completion the second year they will have the skill of Gravure printing process and will reach the level of Advance Diploma in printing Technology. On third year students shall learn the subject on printing finishing technology, Flexographic printing process, Digital and Security printing, mechanical maintenance, Estimating and costing Entrepreneurship with the practical aspects involved with it. Students shall get the Industrial Training and Project work. On completion the third year they will have the skill of security printing, entrepreneurship development and candidate will be awarded Bachelor of Vocation Degree in Printing Technology.
Aims & Objectives	During their studies, students shall learn the detailed aspects of various printing processes like Offset printing, Gravure printing, Flexography, Letterpress and Screen printing including the machineries being used. Also students shall get the subject knowledge of printing material, pre-press technologies, digital printing, Security Printing, print finishing techniques, project work, business management, entrepreneurship development, cost estimation etc. Subjects on packaging technology have been included in the curriculum to impart basic knowledge of packaging technology to enable the students to apply the same in his professional career. It involves several technical skills which hold the prime importance. Each person engaged in performing pre-press work like typesetting, graphics

	designing and editing, making of image carrier, press work and printing, finishing have specific and specialized role to perform and contribute for the final output. Categories of personnel with Diploma/Advance Diploma/ B Voc Degree in Printing Technology shall have the potentiality to get employment in various positions like Shop Floor production personnel, supervisor, production manager, works manager, maintenance personnel, coordinator in publishing and advertising agencies, sales and marketing personnel etc. depending upon the level of qualification.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIRST
SUBJECT TITLE : BASIC ELEMENTS OF PRINTING TECHNOLOGY
CONTENTS : THEORY
SUBJECT CODE : BVPT101

Rationale:

This course aims at creating a foundation among entry level students. It introduces common concepts frequently used in the printing industry such as image carrier, design, various printing techniques and finishing processes. After completion of this course, a student can understand the flow of various printing Processes.

Objectives: The student will be able to:

- Understand flow of printing.
- Understand raw material required for printing.
- Scope of Printing

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIRST
SUBJECT TITLE : BASIC MECHANICAL ENGINEERING
CONTENTS : THEORY
SUBJECT CODE : BVPT102

Rationale:

Printing Engineer is expected to develop basic workshop skills in wood working, Welding, sheet metal and plumbing. Students are require to identify, select and use different kinds of tools, such as marking, measuring,, cutting, supporting, striking and various holding devices.

Objectives:

- Read and interpret job drawing, plan various operations and make assembly.
- Identify and select the proper material for the job undertaken.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIRST
SUBJECT TITLE : SCREEN PRINTING
CONTENTS : THEORY
SUBJECT CODE : BVPT103

Rationale:

Screen printing has created a niche by its wide range of application including packaging and label design, large format printing and special applications. The process also requires less capital for upcoming entrepreneurs. After completion of this course, a student can understand the cloth type, mesh count, different types of image carrier & their preparations; printing on different surfaces; etc.

Objectives: The student will be able to:

- Understand the cloth type, mesh count, different types of image carriers & their preparations; printing on different surfaces.
- Print various job.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIRST
SUBJECT TITLE : BASIC COMPUTER FUNDAMENTALS
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT104

Rationale:

Since early 21st Century the use of Computer has been so rapidly that it is difficult to think of an area where computers are not being used. It is very desirable that everyone should have good knowledge of computer. Main purpose of this subject is how to use a computer for basic needs. This subject covers application software's like MS-Word, MS-Excel, MS-PowerPoint. It is a gateway to wonderful world of information and part of various applications like business, academic, hospitals, construction, designing, chemical fields and many more.

Objectives: The student will be able to:

- Use of Operating System.
- Use MS- Word, MS-Excel, MS- PowerPoint, efficiently for documentation.
- Use browser for accessing Internet.
- Handle Personal Computer System, Scanner, Printer.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIRST
SUBJECT TITLE : BASIC MECHANICAL-LAB
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT105

Rationale:

These workshop practices are commonly used in engineering industries. Knowledge of Basic Workshop Practice enables students to use in preparing composite jobs.

Objectives:

- Identify, select and use various marking, measuring, holding, striking and cutting tools &
  Equipment's.
- Operate, control different machines and equipment in respective shops.

- Inspect the job for specified dimensions
- Produce and inspect the jobs as per specified dimensions.
- Adopt safety practices while working on various machines.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIRST
SUBJECT TITLE : SCREEN PRINTING-LAB
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT106

Rationale:

Screen printing has created a niche by its wide range of application including packaging and label design, large format printing and special applications. The process also requires less capital for upcoming entrepreneurs. After undergoing the practicals of this course, the student would be able to perform multicolour printing with proper registration; understanding the cloth type, mesh count, different types of image carrier & their preparations; printing on different surfaces; etc.

Objectives: The student will be able to:

- Understand the cloth type, mesh count, different types of image carriers & their preparations; printing on different surfaces.
- Print various job.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIRST
SUBJECT TITLE : COMMUNICATION SKILL
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT107

Rationale:

This course aims to build up the learner's confidence in oral and interpersonal Communication by reinforcing the basics of pronunciation

Objectives: The student will be able to:

- To enhance the learners communication skills by giving adequate exposure in reading, writing, listening and speaking skills and the related sub-skills
- To help the learners recognize and operate in various styles and registers in English
- To impart better writing skills by sensitizing the learners to the dynamics of effective writing
- To build up the learners confidence in oral and interpersonal communication by reinforcing the basics of pronunciation.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : SECOND
SUBJECT TITLE : SHEETFED OFFSET PRINTING
CONTENTS : THEORY
SUBJECT CODE : BVPT108
Rationale:

There are many different Offset presses in the market today with many minute operational
Differences. The purpose of this course is not to provide a general operational manual, but to deal with the fundamental understanding that will enable the student to run any offset duplicator or single and multi-color sheet-fed offset printing press after studying the manufacturer's operating manual.

This course covers the information necessary to run an offset press and to give important information on press trouble-shooting concerns also.

Objectives: The student will be able to:

- Understand working of sheet fed offset printing machine.
- Identify the trouble.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : SECOND
SUBJECT TITLE : BASIC PACKAGING TECHNOLOGY
CONTENTS : THEORY
SUBJECT CODE : BVPT109

Rationale:

Packaging is becoming one of the large segments of printing and related industry. This course intends to deal with knowledge of packaging, its requirements such as variety of substrates, finishing operations, conversion, etc. It also includes use of paper, board, metals, glass in packaging, ecology of packaging and tests performed on packaging.

Objectives: The student will be able to**:**

- Understand Packaging
- Understand material required for Packaging

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : SECOND
SUBJECT TITLE : PRINT FINISHING
CONTENTS : THEORY
SUBJECT CODE : BVPT110

Rationale:

Binding is required to protect as well as to enhance the appearance of the printed product. This subject is required for students to understand various binding techniques depending upon the need of the product. In today's state of art print houses, most of the finishing operations are carried out using machines, the working and principle of these machines is also a part of the course. Hot foil stamping, numbering, perforating, embossing, die cutting, are the various finishing processes a student should know in order to understand how these processes increase the utility and beauty of the product.

Objectives: The student will be able to:

- Understand relevance of print finishing techniques in various segments of industry.
- Understand material, machinery and equipment's used in various print finishing process.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : SECOND
SUBJECT TITLE : ADOBE PAGE MAKER AND TYPING
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT111

Rationale:

Computers and software help printer and prepress operator in creating a good design is important. This subject deals with electronic ways of page making, designing and imposing techniques. The emphasis is given on practice of Pagemaker and Typing software packages related to the printing industry and creative use of the tools available with aesthetic sense.

Objectives: The student will be able to

- Understand importance of publishing software in prepress.
- Study and compare features and tools available to printer for digital origination.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : SECOND
SUBJECT TITLE : OFFSET MACHINE – I
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT112

Rationale:

There are many different Offset presses in the market today with many minute operational differences. The purpose of this course is not to provide a general operational manual, but to deal with the fundamental understanding that will enable the student to run any offset duplicator or single and multi-color sheet-fed offset printing press after studying the manufacturer's operating manual.

This course covers the information necessary to run an offset press and to give important information on press trouble-shooting concerns also.

Objectives: The student will be able to:

- Understand working of sheet fed offset printing machine.
- Identify the trouble.
- Perform the registration on the machine.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : SECOND
SUBJECT TITLE : MANUAL BOOK BINDING
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT113

Rationale:

Binding is required to protect as well as to enhance the appearance of the printed product. This subject is required for students to understand various binding techniques depending upon the need of the product. In today's state of art print houses, most of the finishing operations are carried out using machines, the working and principle of these machines is also a part of the course. Hot foil stamping, numbering, perforating, embossing, die cutting, are the various finishing processes a student should know in order to understand how these processes increase the utility and beauty of the product.

Objectives: The student will be able to:

- Understand relevance of print finishing techniques in various segments of industry.
- Understand material, machinery and equipment used in various print finishing process.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : THIRD
SUBJECT TITLE : FOOD AND PHARMACEUTICAL PACKAGING
CONTENTS : THEORY
SUBJECT CODE : BVPT114

Rationale: At the end of the course, learners should be able to;

1. Annalise and choose a barrier material for a specific food product based on barrier properties studied.
2. Annalise and choose a preservation method for a specific food product based product sensitivity and shelf life required.
3. Describe the various characteristics of pharmaceutical drugs and their sensitivities.
4. Select the right type of package form for a pharma product, based on the product nature, form & size.

Objectives:

- Learn and understand the types of food, their modes of deterioration and the fundamentals of package barriers.
- Learn shelf life studies and sensory evaluation based on type of product.
- Study the various food preservation techniques with real-life packaging examples.
- Study the fundamental characteristics of pharmaceutical drugs & their dosage forms.
- Understand the various existing pharma package forms

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : THIRD
SUBJECT TITLE : WEB OFFSET PRINTING
CONTENTS : THEORY
SUBJECT CODE : BVPT115

Rationale:

Web machine operation is required to be learnt in order to understand efficient working procedures. There is plenty of scope for skilful personnel in this branch of printing. This course imparts extensive knowledge about all the elements of web machines used in all the printing processes such as offset, flexography, gravure, as well as quality control procedures & auxiliary operations.

Objectives: The student will be able to:

- Understand working of web offset printing machine.
- Identify the trouble.
- Perform the registration on the machine.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : THIRD
SUBJECT TITLE : COLOR SEPARATION
CONTENTS : THEORY
SUBJECT CODE : BVPT116

Rationale:

Colour Separation is an important pre-press level subject that deals with digital advancements in graphic arts industry. In digital imagining Concept of Colour, colour systems such as CIE LAB, concept of Colour Measurement are very much important for colour correction in digital scanned image. PMT based drum and CCD based flatbed scanners coupled with modern colour Management, PostScript, Portable Document Format, Raster Image Processors, and Image editing software are the buzzword of this subject area. The basic knowledge of these functionalities will be worthwhile for the student and amateur of printing technology to grasp, understand and implement the developments in modern image computing.

Objectives: The student will be able to:

- Understand Concept of color, color measurement, color systems.
- Understand digital image recording by scanners and camera.
- Learn color correction and different tools for color correction in software.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : THIRD
SUBJECT TITLE : COREL DRAW AND PHOTOSHOP
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT117

Rationale:

Computers and software help printer and prepress operator in creating a good design is important. This subject deals with electronic ways of page making, designing and imposing techniques. The emphasis is given on practice of Corel Draw and Photoshop software packages related to the printing industry and creative use of the tools available with aesthetic sense.

Objectives: The student will be able to

- Understand importance of publishing software in prepress.
- Study and compare features and tools available to printer for digital origination.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : THIRD
SUBJECT TITLE : OFFSET MACHINE - II
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT118

Rationale:

Web machine operation is required to be learnt in order to understand efficient working procedures. There is plenty of scope for skilful personnel in this branch of printing. This course imparts extensive knowledge about all the elements of web machines used in all

the printing processes such as offset, flexography, gravure, as well as quality control procedures & auxiliary operations.

Objectives: The student will be able to:

- Understand working of web offset printing machine.
- Identify the trouble.
- Perform the registration on the machine.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : THIRD
SUBJECT TITLE : MECHANICAL BOOK BINDING
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT119

Rationale:

Binding is required to protect as well as to enhance the appearance of the printed product. This subject is required for students to understand various binding techniques depending upon the need of the product. In today's state of art print houses, most of the finishing operations are carried out using machines, the working and principle of these machines is also a part of the course. Hot foil stamping, numbering, perforating, embossing, die cutting, are the various finishing processes a student should know in order to understand how these processes increase the utility and beauty of the product.

Objectives: The student will be able to:

- Understand relevance of Binding techniques in various segments of industry.
- Understand material, machinery and equipment used in various print finishing process.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FOURTH
SUBJECT TITLE : PAPER AND INK
CONTENTS : THEORY
SUBJECT CODE : BVPT120

Rationale:

Paper and Ink are the basic raw material used in Printing Industry. Student should know the Physical and Chemical properties of Paper and Ink. In today's state of art print houses, the tests for various properties are carried out in the Q.C department using different instruments. A Diploma Holder is required to supervise this section in Press and therefore knowledge of this Subject is very essential. Student should know how good quality paper and ink will provide high-speed production with better quality and greater accuracy.

Objectives: The student will be able to:

- Develop knowledge of Paper and ink properties.
- Use effectively different instruments to carry out property tests.
- Annalise various tests to offer the best or required quality material.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FOURTH
SUBJECT TITLE : MATERIAL SCIENCE AND TECHNOLOGY
CONTENTS : THEORY
SUBJECT CODE : BVPT121
Rationale:

1. After Completion of the course, student will have adequate background, conceptual clarity and knowledge of appropriate solution techniques related to:
2. Attain the basic technical knowledge of various materials used in different printing processes.
3. Understand the importance of surface energy and surface tension for the better interaction of substrate and coatings.
4. Know the importance various types of printing inks and their properties required in different printing processes.
5. Understand the various grades of papers used for printing and packaging applications and their properties.
6. Understand the vital role other consumables used during printing.
7. Learn the method of testing the materials scientifically.
8. Understand the role of plastic in printing and packaging industry. 8. Know the process of manufacturing of printing ink and paper.

Objectives: The student will be able to:

- Apply the knowledge to use of metals and polymers in printing and allied industry.
- Apply the knowledge to select the appropriate consumable for the effective use in printing and converting applications.
- Annalise the characteristics of various raw material used in printing ink and to formulate the best suitable ink for the printing application.
- Annalise the properties and testing methods of printing ink for run ability, printability and shelf life.
- Annalise the characteristics of various raw materials used to manufacture paper and its properties for run ability, printability and shelf life.
- Understand the various methods and instruments used for material analysis.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FOURTH
SUBJECT TITLE : GRAVURE PRINTING
CONTENTS : THEORY
SUBJECT CODE : BVPT122
Rationale:

Gravure Processes of Printing are Major Printing Techniques for Printing for Packaging, Newspapers and many other such Products. The subject is being introduced for the first time, exclusively. This will enable students to learn various machines, their configurations and working, used for gravure Printing.

Objectives: The student will be able to:

- Understand working of Gravure printing machine.
- Identify the trouble.
- Perform the registration on the machine.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FOURTH
SUBJECT TITLE : IN DESIGN AND ILLUSTRATOR
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT123

Rationale:

Computers and software help printer and prepress operator in creating a good design is important. This subject deals with electronic ways of page making, designing and imposing techniques. The emphasis is given on practice of In Design and Illustrator software packages related to the printing industry and creative use of the tools available with aesthetic sense.

Objectives: The student will be able to

- Understand importance of publishing software in prepress.
- Study and compare features and tools available to printer for digital origination.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FOURTH
SUBJECT TITLE : PAPER AND INK TESTING
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT124

Rationale:

Paper and Ink are the basic raw material used in Printing Industry. Student should know the Physical and Chemical properties of Paper and Ink. In today's state of art print houses, the tests for various properties are carried out in the Q.C department using different instruments. A Diploma Holder is required to supervise this section in Press and therefore knowledge of this Subject is very essential. Student should know how good quality paper and ink will provide high-speed production with better quality and greater accuracy.

Objectives: The student will be able to:

- Develop knowledge of Paper and ink properties.
- Use effectively different instruments to carry out property tests.
- Annalise various tests to offer the best or required quality material.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FOURTH
SUBJECT TITLE : PACKAGE TESTING METHODS
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT125

Rationale:

Packaging is becoming one of the large segments of printing and related industry. This course intends to deal with knowledge of packaging testing, its requirements such as variety of substrates, finishing operations, conversion, etc. It also includes use of paper, board, metals, glass in packaging, ecology of packaging and tests performed on packaging.

Objectives: The student will be able to:

- Understand packaging testing methods
- Understand material required for packaging

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FOURTH
SUBJECT TITLE : SEMINAR
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT126

Rationale:

The student of printing technology having introduced, learnt and understood the basics of
Graphic reproduction process is well placed to grasp different processes carried out in graphic arts
Industry. Inclusion of the subject seminar requiring student to undertake little enhanced activities so that he or will have developed attitude toward learning and knowing subject related aspect wherein class room environment would be just complementary. The variable for the students to enrich their knowledge kitty are info search, group discussion, industrial visits, seminar presentations and expert or guest lectures.

Objectives: The student will be able to:

- Identify different areas eligible for info collection of his or her interest.
- Identify prevailing or important topic from different areas eligible for seminar preparation
  or presentation of his or her choice.
- Prepare a seminar report on any topic from a prevailing subject of his or her choice.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIFTH
SUBJECT TITLE : DIGITAL AND SECURITY PRINTING
CONTENTS : THEORY
SUBJECT CODE : BVPT127

Rationale:

Pre-press activities such as operating reproduction photography camera, printing down frame, off-line chemical processing of exposed film and plate require more manpower, number of raw materials and are time consuming and perhaps less environment friendly. Digital Imaging techniques sans camera, printing down frame and even film are replacing conventional imaging technologies at faster rate. Output quality rendered by any of the digital imaging technique promises saving in turnaround time, cost incurred on account of manpower required, and effective use of raw materials. These techniques also offer easiest ways of storing original, positives and negatives in digital form and unmatched digital

quality. Thus understanding the concepts of digital imaging and its scope in inevitable for aspirants of career in printing technology.

Objectives: The student will be able to:

- Understand the various principles used in digital printing system.
- Use different illuminant and outputting devices required in digital printing techniques.
- Understand the Security printing inks, substrate and process

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIFTH
SUBJECT TITLE : FLEXOGRAPHY PRINTING
CONTENTS : THEORY
SUBJECT CODE : BVPT128
Rationale:

Flexography Processes of Printing are Major Printing Techniques for Printing for Packaging, papers and many other such Products. The subject is being introduced for the first time, exclusively. This will enable students to learn various machines, their configurations and working, used for gravure & flexography Printing.

Objectives: The student will be able to:

- Understand working of flexo printing machine.
- Identify the trouble.
- Perform the registration on the machine.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIFTH
SUBJECT TITLE : PRINTING AND PACKAGING MANAGEMENT
CONTENTS : THEORY
SUBJECT CODE : BVPT129
Rationale:

Management of organization is paramount since quite long. Printing industry like other industry has also been consolidated and is now reflecting in all forms of ownership. To be a going concern printing organization needs to be professionally management in a dynamic and competitive business environment. In addition globalization and liberalization has also been complementary and influential factors for formal management education being widely followed. These developments have, therefore, emphasized the need of student of printing technology to be formally educated in the following subject.

Objectives: The student will be able to:

- Understand relevance of formal management education in printing, allied industry.
- Understand organization structure, departmentalization and financing printing concern.
- Understand organization structure, departmentalization of costing department.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIFTH
SUBJECT TITLE : ADVERTISING AND MULTIMEDIA
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT130

Rationale:

Computers and software help printer and prepress operator in creating a good design is important. This subject deals with electronic ways of page making, designing and imposing techniques. The emphasis is given on practice of Corel Draw and Photoshop, in design and Illustrator software packages related to the printing industry and creative use of the tools available with aesthetic sense.

Objectives: The student will be able to

- Understand importance of publishing software in prepress.
- Study and compare features and tools available to printer for digital origination.
- Understand the multimedia and designing for advertising
- The concepts of Advertising.
- Role of the media
- Advertising Production and Business in detail

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIFTH
SUBJECT TITLE : PACKAGE DEVELOPMENT
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT131

Rationale:

Packaging is becoming one of the large segments of printing and related industry. This course intends to deal with knowledge of packaging development, its requirements such as variety of substrates, finishing operations, conversion, design etc.

Objectives: The student will be able to:

- Become acquainted with the nature and impact of visual communications in packaging design
- To familiarize with the various graphic design and software's
- To conduct various characterization tests for packaging materials

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIFTH
SUBJECT TITLE : PRINTING MACHINE MAINTENANCE
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT132

Rationale:

In the atomization era printing machines are modified with advance mechanical and electronic components. It is necessary to maintenance the machine and it's all components for max. benefits. This subject includes information about mechanical and electronic components used in printing machine and how to maintain the components for preventing damage and breakdown.

Objectives: The student will be able to:

- Understand mechanical and electronic components.
- Learn maintenance of machines.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : FIFTH
SUBJECT TITLE : FLEXOGRAPHY-LAB
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT133

Rationale:

This subject is related to flexo plate preparation process and flexography printing process being introduced for the first time, exclusively. This will enable students to learn flexography plate making process as well as flexography printing process.

Objectives: The student will be able to:

- Understand working of flexo plate making machine.
- Understand working of flexo printing machine.
- Identify the trouble.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY
SEMESTER : SIXTH
SUBJECT TITLE : INTERNSHIP / INDUSTRIAL TRAINING
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT134

Objectives: The student will be able to:

The main objective of the Industrial Training is to experience and understand real life situations in industrial organizations and their related environments and accelerating the learning process of how student's knowledge could be used in a realistic way.

I. At the end of the training they have to submit a report with following information:

1. Profile of the Industry
2. Product range
3. Organization structure
4. Plant layout
5. Processes/Machines/Equipment/devices
6. Personnel welfare schemes
7. Details of the training undergone
8. Projects undertaken during the training, if any

9. Learning points.

II. End Semester examination will be a Viva-Voce Examination.

COURSE NAME : B.VOC. IN PRINTING TECHNOLOGY

SEMESTER : SIXTH
SUBJECT TITLE : PROJECT WORK
CONTENTS : PRACTICAL
SUBJECT CODE : BVPT135

Objectives:

A Project topic must be selected by the students in consultation with their guides. The aim of the project work is to deepen comprehension of principles by applying them to a new problem which may be the design and fabrication of a device for a specific application, a research project with a focus on an application needed by the industry/society, a computer project, a management project or a design project.

The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated jointly by external and internal examiners constituted by the Head of the Department based on oral presentation and the project report.

Department of Geology

Program outcome : B.Sc.	
8.	To study of 3 D distribution of rocks with respect to deformational history
9.	To understand structure like fold fault and unconformities use as traps in oil exploration
10.	Applied geology study in engineering project
11.	Study in vast ranging from submicroscopic lattice defect in crystals
12.	To explore the earth and solar system
13.	Diamond like sources find out from kimberlitic rocks
14.	To study of volcano, earthquake,Lanslide ,flood,Tsunami
15.	To find out fossils in sedimentary for the purpose of age determination
16.	Global warming impact on glaciers and green house effect
17.	Great job opportunity in Direct recruitment through in UPSC and MPSC geology

Program Specific outcome : B.Sc.	
9.	To study of economic mineral resources
10.	To understand Engineering project through the geological conditions
11.	Study History of the earth and evolution of the earth
12.	Petroleum exploration
13.	Mitigation to prevent the natural hazards –Earthequake, Lanslide, flood
14.	Explore the core of the earth from the Minning
15.	Coal exploration for geothermal prospecting
16.	Remote sensing and GIS for the purpose of navigation and information details of the economical and defense study purpose
17.	Gemstone and ore minerals extract from the earth
18.	To study of groundwater –rainwater harvesting and watershed manamgemaent, for irrigation and also contamination of groundwater trace elements are removed through the knowledge

Course Outcomes of BSc (Geology):

Class	Course title	Outcome
FYBSc (Paper-I)	Stratigraphy,Palaentology and Fundamental Geology	The students will understand the origin of our solar system and planets, including earth. The students are exposed to the Geological time scale and be able to appreciate the dynamics of earth evolution through time. The students to understand the changes that occurred in the history of the earth and relate them to their field observations
FYBSc- (Paper-II)	Mineralogy and Petrology	The students will be able to identify common rock-forming minerals n hand specimens. The students will have gained an understanding of the processes involved in the formation of rocks
FYBSc- (Paper-III)	Practicals related to Mineralogy and Petrology and also Paleontology	Geology work together to unearth the secrets of age from rocks of the earth's crust. Palaeontologists study the remains of plants and animals which have been preserved in the earth's crust by natural processes students knowledge with respect to understanding the essentials of the structural dynamics of the earth

Semester I

SYBSc- (Paper-I)	Mineralogy, Optics and Gemstone	Optics study for rock identification and minerals constituents and gemstones for precious and jewelry also in horoscope
SYBSc (Paper-II)	Structural Geology	Mapping for large area and study of various structures on earth crust

Semester II

SYBSc (Paper-I)	Petrology	To study of assemblage of mineral constituents to identify the rocks
SYBSc (Paper-II)	Stratigraphy and Palaeontology	Study of Ancient life and habitat
SYBSc (Paper-III)	Mineralogy,Gemstones,Petrology,Ore Minerals,Crystallography,Micropalaentology and	Economic valuable minerals study and gemstones for the purpose of sunshine

	Structural Geology	

Semester I

TYBSc (Paper-I)	Mineralogy	To study of minerals for observation of the rocks in the field
TYBSc (Paper-II)	Igneous Petrology	To understand Primary rocks from magma source and Active and extinct volcano
TYBSc (Paper-III)	Sedimentary Petrology	Study of Depositional environment and exploration of oil in sedimentary rocks only
TYBSc (Paper-IV)	Structural Geology	Mapping purposes and various structures are studied
TYBSc (Paper-V)	Precambrian Stratigraphy of India	Historical study and age of the rocks in india
TYBSc (Paper-VI)	Applied Geology(Geomophology,Rmote sensing,GIS and field geology)	Satellite imageries used in agricultural and natural hazards, navigations, Explore the earth for economic sources

Semester II

TYBSc (Paper-I)	Metamorphic Petrology	Study of rocks for changes in climatology
TYBSc (Paper-II)	Environmental Geology	It helps to discover the mitigation of natural disaster and hazards
TYBSc (Paper-III)	Economic Geology	Oil,petroleum,coal exploration in india
TYBSc (Paper-IV)	Geotechtonics	Mineral resources and Petroleum exploration and study of earthquakes
TYBSc (Paper-V)	Phenerozoic Stratigraphy of India and Paleontology	It helps to study of Paleoclimatic condition
TYBSc (Paper-VI)	Apllied Geology II(Prospecting, Engineering Geology and	Engineering project associated with human development and various types of structure, to find out groundwater through the scientifically

	Hydrology)	
TYBSc (Paper-VII)	Mineralogy and Petrology	Study of minerals metallic and non metallic,Gemstones and rocks
TYBSc (Paper-VIII)	Structural geology, Economic geology, Paleontology and Indian Stratigraphy	Economic minerals sources explore and study of discovered folded mountains and valleys and study of mega and micro fossils for the purpose of archeology
TYBSc (Paper-IX)	Applied Geology(Remote Sensing, Geohydrology, Geophysical prospecting, Field geology and Environmental geology)	Aerial photography for the weather forcasting Disater management,Agiricultural development,Extracting economic minerals through the satellite image