KANCHI SHRI KRISHNA COLLEGE OF ARTS & SCIENCE, KILAMBI, KANCHIPURAM.
DEPARTMENT OF MICROBIOLOGY
2.6 PROGRAMME OUTCOME AND PROGRAMME SPECIFIC OUTCOME

PROGRAMME : B.SC MICROBIOLOGY

1. Programme LearningOutcome

Nature and Extent of theProgramme

The undergraduate programme in Microbiology is the first level of college or university degree in the country as in several other parts of the world. After obtaining this degree, a microbiologist may enter into the job market or opt for undertaking further higher studies in the subject. After graduation the students may join industry, academia, and public health and play their role as microbiologists in a useful manner contributing their role in the development of the welfare society. Thus the undergraduate level degree in microbiology must prepare the students for all these objectives. Thus the LOCF curriculum developed has a very wide range covering all aspects of Microbiology with reasonable depth of knowledge and skills so to as to diversify them in various specialties of the subject and play their role professionally as expected of them. It is also imperative that microbiologists are evaluated in a manner appropriate to assess their proper development as microbiologists.

PROGRAMME SPECIFIC OUTCOME

Aim of theProgramme

The aim of the undergraduate degree in Microbiology is to make students knowledgeable about the various basic concepts in a wide ranging context which involve the use of knowledge and skills of Microbiology. Their understanding, knowledge and skills in Microbiology needs to be developed through a thorough teaching learning processes in the class, practical skills through the laboratory work, their presentation and articulation skills, exposure to industry and interaction with industry experts.

Graduateattributes

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. They should have the appropriate skills of Microbiology so as to perform their duties as microbiologists. They must be able to analyze the problems related to microbiology and come up with most suitable solutions. 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. 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. Several newer developments are taking place in microbiology. 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. They are also made aware ofthe requirements of developing a Microbiology enterprise by having knowledge of patents, copyrights and various regulatory processes to make their efforts a success.

Besides attaining the attributes related to the profession of Microbiology, the 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. 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 theglobe.

COURSEWISE OUTCOME

Class/ Semester	Paper/	Title / Subject Name	Course Outcome
I B.SC **Semester - I**	Core Paper I / **I**	General Microbiology and Microbial Physiology	**Learning Outcomes:** 1. Understand the developments in Microbiology and list the contributions of various scientists. 2. Illustrate the structure and function of Microbial cells. Utilize the principles and applications of different types of Microscope. Apply various staining procedures for visualising microorganisms under the microscope. 3. Analyse the nutritional requirement of microorganisms and their cultivation techniques under laboratory conditions. Assess the implication of various sterilisation procedures and bio safety measures in clinical labs and industries. 4. Assess various metabolic pathways occurring in microorganisms and their significance. 5. Acquire knowledge about antibiotics and mode of action.
I B.SC **Semester - I**	Core Practical –I-Major Practical-I	General Microbiology And Microbial Physiology	Learning outcomes: 1. Learn the concept of sterilization processes and apply them in sterilization of different media. 2. Acquire skills to isolate an organism using different technique and to Know various Culture media and their applications. 3. Attain the practical skills in microscopy and their handling techniques and staining procedures. 4. Studying the comparative characteristics of eukaryotes. To evaluate antibiotic sensitivity pattern using different methods. 5. Identification of pathogens by standard techniques and methods of culturing preservation and maintenance of microorganisms
I B.SC **Semester - II**	Core Paper III	Basic and Applied Immunology	**Learning outcomes:** 1. Understanding the key concepts in immunology and overall organization of the immunesystem. 2. Understanding the structure of antigen andantibody. Comprehend the salient features of antigen antibody reaction &its uses in diagnostics and various other studies. 3. Illustratively assess hypersensitivity and autoimmunedisorders. 4. Analyze graft rejection in transplantation by learning the MHC molecules and their functions. 5. Learn about immunization and their preparation and its importance
I B.SC	Core Paper IV Major Practical II	Basic And Applied Immunology	Learning outcome: 1. Demonstrate detailed knowledge and understanding of immunology and the way it is applied in diagnostic and

Semester - II			therapeutic techniques and research; 2. Demonstrate knowledge and practical skills in undertaking simple immunological experiments that mimic those undertaken in diagnostic laboratories and research laboratories; 3. Demonstrate literature review skills in undertaking a large survey of a complex field within immunology, synthesis the information from primary medical literature; 4. Coherently to write a report in the appropriate language of the field. 5. Articulate and adhere to safe working practice in a mixed microbiology/immunology laboratory.
II B.SC **Semester - III**	Core Paper V	Molecular Biology	**Learning Outcomes:** **1.**Understand the chemical components of DNA and various forms of DNA. Know about the organization of prokaryotic and eukaryotic genome. 2. Understand the DNA replication, repair and recombination in prokaryotes with that of eukaryotes. 3. To know about RNA synthesis and processing and function of different types of RNA. 4. To know about protein synthesis and inhibition factors of protein synthesis. 5. To Understand prokaryotic and eukaryotic gene expression and control of gene expression.
II B.SC **Semester - III**	Core Paper VI	Major Practical III (Molecular Biology)	**Learning Outcomes:** 1. Learn to estimate DNA and RNA. 2. Learn to isolate Plasmid, Genomic and Chromosomal DNA. 3. Learn to isolate RNA and antibiotic resistant mutants. 4. Acquire Knowledge in Preparation of competent cells. 5. Acquire Knowledge in Transformation of E. coli.
II B.SC **Semester - IV**	Core Paper VII	Soil and Agricultural Microbiology	Learning Outcome: 1. Upon successful completion of this course, the student should be able to understand types, structure, formation and microbial flora of soil. 2. Understand the role soil microflora in biogeochemical cycle in the environments. 3. Know about the mechanism and responsibility of microbial interaction with microbes, plant, animal and insects. 4. Be familiar with the role of microorganism in nitrogen fixation and know about the types and mode of action of biopesticides. 5. Know about defense mechanism, etiology, epidemiology and management various plant diseases caused by microorganisms.
II B.SC **Semester - IV**	Core Paper VIII	Major Practical IV (Soil and Agricultural Microbiology)	**Learning outcome:** 1. By the end of the course, the student should be able to learn different methods for the isolation and identification soil microorganisms. 2. Understand the mechanisms and application of enzymes produced by soil microorganisms. 3. Know about the role and methods used for the isolation and identification of Rhizobium and Azotobacter. 4. Know about the application and methods used for isolation and identification of nitrogen fixing algae. 5. Understand the causes, symptoms, control and treatment of various plant diseases caused by microorganisms.

III B.SC **Semester - V**	Core Paper IX	Medical Bacteriology	**Learning outcomes:** 1. Knowledge of various techniques of sample collection, transport and processing for laboratory diagnosis of bacterialdiseases. 2.Knowledge of basic and general concepts of causation of disease by the pathogenicmicroorganisms. 3.Information for the assessment of their severity including the broad categorization of the methods ofdiagnosis. 4.Insights to practical aspects of antibiotic sensitivitytesting. 5.Knowledge of various zoonotic infections, ways to tackle them and use biosafety precautions.
III B.SC **Semester - V**	Core Paper X	Medical Mycology and Parasitology	**Learning outcomes**: 1. Information for collection of different clinical samples, their transport, culture and examination by microscopy, staining and biochemical methods for the diagnosis of fungal and protozoan diseases. 2. Knowledge of basic and general concepts of causation of disease by the pathogenic microorganisms and the various parameters of assessment of their severity including the broad categorization of the methods of diagnosis. 3. Insights to treatment options of fungal and protozoan diseases. 4. Knowledge about the importance of protozoan in the intestine. 5. Knowledge of Nematodes as infectious agent.
III B.SC **Semester - V**	Core Paper XI	Medical Virology	Learning outcomes: 1. Knowledge about viruses and the chemical nature of viruses, different types of viruses infecting animals, plants and bacteria - Bacteriophages 2. Understanding about the emerging viral diseases. 3. Information about the role of viruses in the causation of the cancer. 4. Gain wider knowledge on clinical aspects and related implications of viral diseases. 5. Knowledge on viral vaccines and antiviral drugs.
III B.SC **Semester - V**	Core Paper XII	Major Practical V (Medical Bacteriology, Mycology, Parasitology and Virology)	Learning outcomes: 1.Skills to identify medically important bacteria, fungus and parasites from the clinical samples. 2.Very good information about practical aspects of collection of different clinical samples, their transport, culture and examination by staining, and biochemical tests for diagnosis of bacterial diseases. 3.In depth knowledge on clinical sample processing. 4.Knowledge to promote diagnostic skills, including the use and interpretation of laboratory tests in the diagnosis of infectious diseases. 5.Insights to antibiotic sensitivity determination.
III B.SC **Semester - V**	Elective-I	Biotechnology and Genetic Engineering	Learning outcomes: 1. Acquire knowledge about the History and the development of biotechnology and genetic engineering with the contribution of the scientist 2. Equipped with various production methods of the widely used biotechnological products 3. Gain basic understanding of role of the enzymes as a tool in Biotechnology 4. Learn the significance of Vector, as a tool in the construction of genetic modification of the organisms.

			5. Be familiarize with understanding of use of biotechnology and genetic engineering in health,agriculture and industries.
III B.SC **Semester - VI**	Core Paper XIII	Environmental Microbiology	Learning outcome : 1. The basic knowledge about the natural ecosystem and role of microorganisms in the eco system. 2. An understanding of the composition of air, air borne organisms and how the organisms causes the diseases and its preventive measures 3. Knowledge about different types of microorganism in water causes of water pollution, and methods to analyze the quality of water and treatment for purification of drinking water, hygienic practices to control the water borne diseases. 4. An understanding the role and application of microorganisms to degrade the environmental contaminants. and microbes involved in solid and liquid waste management. 5. Knowledge about the role of microbes in biodegradation and bioremediation of heavy metals and hydrocarbon etc.
III B.SC **Semester - VI**	Core Paper XIV	Food and Dairy Microbiology	Learning outcome: 1. Gain knowledge about food as a substrate for various microbes, the role of factors and its importance 2. Understand about the principles and application of different types of food preservation technique, chemical preservative and its advantages and disadvantages 3. Equip themselves the pragmatic understanding of food spoilage 4. Acquire a thorough understanding of food borne diseases, testing methods, and preventive technique. 5. Learn about the various fermented product and its various stage spoilage
III B.SC **Semester - VI**	Core Paper XV Major Practical VI	Environmental, Food and Dairy Microbiology	Learning outcome: 1. To learn about Detection of number of Bacteria in milk by various method. 2. Gains knowledge to determine the quality of milk. 3. Learn to isolate the yeast and molds from spoiled nuts, fruits, and vegetables and also to examine specific food for bacterial contamination. 4. Knowledge gain to determine of BOD and COD of wastewater and Water analysis by MPN and Membrane filter method. 5. Learn to Quantify the microorganisms in air settle plate and air sampler methods. Detection of aflatoxin B1 from moldy grains using thin

			layer chromatography.
III B.SC **Semester - VI**	Elective II	Industrial and Pharmaceutical Microbiology	Learning outcome: 1. Understand the basic knowledge about the fermentation process and the requirements of process. 2. Gain the basic knowledge about the designing of fermentation 3. Acquire the knowledge about the production of antibiotic and enzymes 4. Equip themselves about knowledge of the various separation procedures in pharmaceutical industries 5. Understand about the principles of raw material used in pharmaceuticals and validation and sterility of pharmaceutical product
III B.SC **Semester - VI**	Elective III	Microbial Marketable Products	Learning outcome: 1. Acquire the knowledge about Spirullina and its cultivation 2. Gain in depth knowledge about edible mushroom and its cultivation 3. Acquire a thorough understanding of the importance of probiotics in human health and their production on a large scale 4. Get an awareness of the availability of natural pigment and its application, Bio fertilizers and their application 5. Imbibe knowledge on the various marketing strategy such as patenting, trade mark, marketing, license procurementetc.

BSc Chemistry

	Thepurposeoftheundergraduatechemistryprogramattheuniversityofmumbai **BSc** is to provide the basic concepts in chemistry and various laboratoryresourcesto **Chemistry** preparestudentsforc areersandasprofessionalsinthefieldofchemistry,for **PSO:** graduate study in chemistry, biological chemistry and relatedIndustrial, Pharmaceutical fields. Students will be able to explore new areas of research in both chemistry and allied fields of science and technology	
Paper-I	General chemistry-I	1.To know the fundamental concepts of atomic structure and basics of quantum mechanics. 2. To know the periodicity of properties of elements. 3. To understand the various types of chemical bonding and basics of solid state. 4. To learn the principles of inorganic qualitative and quantitative analysis. To understand the basic concepts of nanotechnology 5. To understand the basic concepts of organic chemistry
Paper-II	General chemistry-II	1.To equip the learners with concepts of s block elements through comparative study. 2. To equip the learners with concepts of p block elements through comparative study. 3. To understand the aspects of gaseous state. 4. To understand the aspects of liquid state, colloids and carbon nanotubes, fullerenes 5. To understand the chemistry of organic compounds like alkanes, cycloalkanes, alkenes, alkynes and the conformational analysis.
Paper-IV	General chemistry-III	1.To understand the general characteristics of Nitrogen and Oxygen families. 2. To know about the chemistry of Halogens and noble gases. 3. To learn the mechanism of Nucleophillic substitution and Elimination reactions. 4. To know about the reaction mechanisms of aromatic and heterocyclic compounds. 5. To understand the basic concepts of Thermodynamics and Thermochemistry.
Paper-V	General chemistry-IV	1. To understand the chemistry of Redox reactions. 2. To understand the General characteristics of d-Block elements 3. To learn about the preparation and properties of Heterocyclic compounds and dyes. 4. To know about the nomenclature, preparation and properties of alcohols, thiols, ethers and thioethers. 5. To understand the limitation of I law of thermodynamics and the need of II law of thermodynamics.
Paper VII	In-organic Chemistry-I	Students will gain an understanding of: 1. The periodic table including s,p,d,f-bloock elements 2. the bonding fundamentals for both ionic and covalent compounds, including electro negativities, bond distances and bond energies using MO diagrams and thermodynamicdata 3. predicting geometries of simplemolecules 4. the fundamentals of the chemistry of the main group elements, and important real worldapplications of

		many of thesespecies 5. the use of group theory to recognize and assign symmetry characteristics to molecules and objects, and to predict the appearance of a molecule's vibrational spectra as a function of symmetry the bonding models, structures, reactivity's, and applications of coordination complexes, boron hydrides, metal carbonyls, andorganometallics
Paper VIII	Organic Chemistry -I	Students will gain an understanding of: 1. how to calculate limiting reagent, theoretical yield, and percentyield 2. how to engage in safe laboratory practices by handling laboratory glassware, equipment, and chemical reagents appropriately 3. how to dispose of chemicals in a safe and responsible manner 4. how to characterize products by physical and spectroscopic means including mp, IR, NMR, GC, andMS 5. howtoconsultthescientificliteratureforphysical data and experimental procedures 6. how to perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration, and thin-layerchromatography 7. how to create and carry out work up andseparation procedures 8. how to critically evaluate data collected to determinetheidentity,purity,andpercentyieldof products and to summarize findings in writing in a clear and concisemanner 9. how to predict the outcome of organic reactions using a basic understanding of the general reactivity of functional groups andmechanism 10. Stereochemistry Spectroscopic techniques for structure elucidation of compounds using UV.IR,NMRand Mass spectroscopictechniques.
Paper-IX	Physical Chemistry-I	Students will gain an understanding of: 1. the application of mathematical tools tocalculate thermodynamic and kineticproperties 2. the derivation of rate equations from mechanistic data chemical equilibrium and its relationship withthermodynamic quantities 3. basic quantum chemistry and atomic structures of atoms 4. chemical kinetics; how reaction rates are measured and represented in rate laws, and applications of chemical kinetics in studying enzyme mechanisms 5. concepts in thermodynamics, different thermodynamicquantitiessuchasheatandwork and how they are measured, relatedor transformed from one another

Paper -XIII	Inorganic Chemistry II	1. Learning the theories of metallic bonding 2. Introduced to organometallic compounds 3. Introduced to fundamental concepts of nuclear chemistry and radioactivity 4. Learning the chemistry of clathrates, phosphazenes, silicates.
Paper XIV	Organic Chemistry II	1. Learning the chemistry of biopolymers – carbohydrates and proteins 2. Understanding vitamins 3. Learning the chemistry of natural products – alkaloids and terpenoids 4. Learning the mechanism of various types of molecular rearrangement 5. Introduced to the concepts of stereochemistry.
Paper XV	Physical Chemistry II	1. Learning the basics of chemical kinetics 2. Understanding the basics of catalysis and adsorption 3. Introduced to the fundamentals of photochemistry 4. Learning the basics of computational chemistry 5. Learning the fundamentals of electrochemical cells.
Elective I a	Pharmaceutical Chemistry	Learning various terminologies in pharmacology; Types of drugs and their action.
Elective II b	Polymer Chemistry	Introduction to types of polymers and their properties; mechanism of polymerization, polymerisation techniques; Polymer processing; Chemistry of industrially important polymers.
Elective III a	Analytical Chemistry	Analytical Students will gain an understanding of: 1. the use of an analytical balance for massmeasurement 2. the use of graduated cylinders, graduated pipettes, and volumetric pipettes for volumetric measurement 3. theuseofthermometersandtemperatureprobes 4. Classical and Instrumental methods ofanalysis. 5. the calibration and use simple spectrophotometers,pHmeters,centrifuges,and vortexers 6. the preparation of buffer solutions at a required pH, given a choice of solutions of acid/conjugate base pairs 7. the identification of the absence or presence ofa numberofcationsoranionsinsolution,using tests based on acid-base, solubility, and complexation equilibria 8. how to set up and use an electrolysis cell to determine the equivalent mass of an unknown metal 9. ligand strengths by the stability of thecomplexes and precipitates formed by the ligands with a given metal ion The basic principle and working of different instruments such as GC,HPLC ,AAS, Flame photometeretc

	Allied Physics –I	On the successful completion of the course, students will be able to Explore the fundamental concepts of physics Import knowledge about the importance of material properties, heat, sound, optics, atomic and nuclear physics. Understand the energy involved in nuclear reaction Carry out the practical by applying these concepts Get depth knowledge of physics in day today life
	Allied Physics –II	Acquire knowledge on elementary ideas of electricity and magnetism Emphasize the significance of laws involved in electric circuits¬ Understand the basics of operational amplifier¬ Apply the principles of electronics in day to life¬ Apply the characteristics of electronic devices in practicals.¬
	Allied Mathematics –I	Students gain knowledge about basic concepts of Algebra, Theory of Equations, Matrices, Trigonometry and Calculus.
	Allied Mathematics-II	Students gain knowledge about basic concepts of Differential Equations, Laplace Transforms, Vector Analysis and Calculus.
	Allied Zoology –I	Students will be able to (i) Know the general classification of invertebrates and chordates (ii) Depict the structural diversity of various animal phyla and their significance
	Allied Zoology-II	Students will be able to (i) Understand the structure of animal cell and functions of important cell organelles (ii) Know the basic concept of inheritance, structure of nucleic acids (iii) Attain the concept of developmental stages in animals (iv) Gain knowledge in the physiological functions of Human organ systems.

BSC Physics

Programme Outcomes (PO), Programme Specific Outcomes (PSO) and Course Outcomes (CO) at VESASC

Aided Section		
BSC Physics PO: Apart from expertise in respective fields, a BSC student is imbibed with realization of human values, a sense of social service, becomes a responsible and dutiful citizen, develops a critical Temper and creative ability. The main objective of science education has evolved to concern the education of future citizens being able to contribute to the growth of global issues.		
BSC Physics PSO: The Degree Programme in physics course allows students to develop traditional practical skills and techniques and increase their abilities in the use of mathematics, Which is the language of physics This Programme enables the students to develop scientific temper, observation skills, problem solving and critical thinking skills. It empowers them with knowledge leading to higher learning in applied sciences. It fosters research attitude among the Students and helps them serve for the betterment of the society.		
Class/ Paper/ Semester	Title	Course Outcome
FY Paper I Sem I	Mechanics and Properties of Matter	**Course Objectives:** To make the students understand the basic principles of mechanics and enable them to analyze and solve problems and make the students learn and understand the properties of materials. **Learning outcome:** After successful completion of this paper, students will be able to: Acquire knowledge on the conservation law Analyse the strength of materials in terms of their size and shape. Understand the fluid dynamics that gives the fundamental knowledge over many practical applications
FY Allied Paper I Sem I	Mathematics I	Students gain knowledge about basic concepts of Algebra, Theory of Equations, Matrices, Trigonometry and Calculus.
FY Paper II Sem II	Thermal Physics and Acoustics	**Course Objective:** To make the students understand the various thermo dynamical concepts and principles and to solve problems and Acoustics **Learning Outcome:** Upon completion of the course students will be able to: Acquire knowledge of Heat and different measurement techniques in calorimetry. Use thermodynamic terminology correctly Explain fundamental thermodynamic properties Analyze the phenomena of simple harmonic

		motion and the properties of systems executing such motions □ □ Know the different methods of producing ultrasonic waves and its applications □ □ Determine the modulus of elasticity through different experimental techniques
FY Allied Paper II Sem II	Mathematics II	Students gain knowledge about basic concepts of Differential Equations, Laplace Transforms, Vector Analysis and Calculus.
SY Paper III Sem III	Optics	**Course Objective :** To understand the defects in lenses and rectifying methods. To study the applications of Interference, diffraction and polarization. To gain overall knowledge in spectroscopic techniques. To inculcate in depth knowledge in Lasers **Learning Outcomes :** After completing the course, the student will be able to □ □ Know the methods of rectifying different defects in lenses. □ □ Work with interferometers and other optical instruments. □ □ Distinguish between resolving power and dispersive power. □ □ Understand the rectilinear propagation of light. □ □ Be conversant withproduction and detection of different types of polarized light. □ □ Extract the dynamic information about the molecules using the spectroscopic techniques □ □ Distinguish different types of Lasers
SY Allied Paper III Sem III	Chemistry I	Learning Outcome 1. To know the fundamentals of Nuclear Chemistry 2. To understand the industrial application of Fuels, Fertilizers and Polymers 3. To understand the basic concepts of Organic Chemistry 4. To study the various laws of Thermodynamics 5. To learn the fundamentals of Chemical Kinetics and basics of Photochemistry
SY Paper IV Sem IV	**ATOMIC PHYSICS**	**Course Objectives:** To study the transition from particle to wave nature To study the atomic structure and spectral series with electric and magnetic fields **Learning Outcomes:** On completion of the course the students will be able to □ □ Use Photo electric effect appropriately □ □ Analyze the atomic structure and associated coupling schemes

		□ □ Understand the splitting of spectral lines due to electric and magnetic fields □ □ Be familiar with X rays and its applications
SY Allied Paper IV Sem IV	**Chemistry II**	Learning outcome 1. To understand the fundamentals of coordination chemistry and its applications 2. To learn the structural aspects of biologically important compounds 3. To know the applications of phase rule and freezing mixtures 4. To explain the basics ofelectrochemistry 5. To understand the basics of Analytical chemistry
TY Paper V Sem V	**ELECTRICITY AND ELECTROMAGNETISM**	**Course Objective:** To give the students a firm understanding of the basics of Electricity and Magnetism. To familiarize the fundamentals of electromagnetic theory and applications of electromagnetic induction **Learning Outcomes:** After the successful completion of this paper, students will be able to: □ □ Demonstrate Gauss law, Coulomb's law for the electric field and apply it to systems of point charges as well as line, surface and volume distribution of charges □ □ Understand the principle of capacitors and dielectric properties □ □ Explain Faraday and Lenz's laws to articulate the relation between electric and magnetic fields □ □ Use Ballistic Galvanometer with the state of art. □ □ Apply Maxwell's equations to arrive at different optical constants
TY Paper VI Sem V	**Nuclear Physics And Particle Physics**	**Course Objective:** To study the basic structure of nucleus and nuclear models To analyse the radioactivity of nuclear substances and radiation hazard To introduce the concept of elementary particles. **Learning outcomes:** On completion of the course the students will be able to □ □ Describe the nuclear models □ □ Understand the half life and mean life of radioactive substances and the mechanism of radiation □ □ Appreciate the production of nuclear energy through nuclear fission □ □ Understand the aspects of Radiation Physics and the impact on the environment □ □Be familiar with the conservation laws associated with elementary particles.
TY Paper VII	**SOLID STATE PHYSICS**	**Course Objectives:** · To understand the fundamental concepts of crystal

Sem V		structure. · Toanalyze the crystal structure using X-ray diffraction methods. · To acquire knowledge on the basics of magnetic phenomena on materials and various types of magnetization. · To learn the properties of superconducting materials. **Learning Outcomes:** · Helps as pre-requisite for understanding materials science, nano science, etc. · Gives relationship between structure and properties of the solid state systems. · To understand the importance of superconducting materials in engineering applications. · To understand the different types of bonding in solid substances. · To understand the magnetic and dielectric properties of crystalline structures
TY Paper VIII Sem V	**BASIC ELECTRONICS**	**Course Objectives:** To study the characteristics and application of various semiconductor devices. To study the basics of electronic Instrumentation. **Learning Outcomes:** On completion of the course the students will be able to □ □ Handle basic electronic devices like diode and transistor □ □ Construct amplifiers of different specification □ □ Apply Barkhausen criteria to oscillators □ □ Understand the different types of multivibrators □ □ Get an idea about Instrumentation
TY Paper IX Sem V	**NUMERICAL METHODS**	**Course Objectives:** To study the computational techniques involved in different mathematical manipulation. **Learning Outcomes:** On completion of the course the students will be able to □ □ Solve simultaneous equations using methodof triangularisation □ □ Find the inverse of a matrix using Gauss Jordan Method □ □ Solve Algebraic, Transcendental and Differential Equation using different methods □ □ To fit a curve for the given data using principles of least squares □ □ Integrate the functions using different rules like Simpsons 1/3 rule
TY Paper X Sem VI	**Relativity and Quantum Mechanics**	**Course Objective:** To introduce to the undergraduate students the development and formulation of Quantum Mechanics, its under lying Mathematical and Physical principles

		through exactly solvable problems. **Learning Outcomes:** On completion of the course the students will be able to □ □ Understand the space- time concept through relativity □ □ Know the inadequacies of classical mechanics in explaining microscopic phenomena □ □ Introduce with the concept of matter waves and their existence proved by experimental procedure and uncertainty principle in physical measurements □ □ Formulate quantum mechanics through Schrodinger equation and associated different operators □ □ Derive time dependent and independent Schrödinger equations □ □ Find eigen values and eigen functions of one dimensional and three-dimensional problems
TY Paper XI Sem VI	Mathematical Methods In Physics	**Course Objective:** To familiarize students with essential mathematical methods for solving advanced problems in theoretical physics. **Learning Outcomes:** Upon completion of the course, the student should be able: □ □ To use advanced mathematical methods and theories on various mathematical and physics problems. □ □ To develop the skill of problem-solving ability. □ □ Use Matrices to solve simultaneous equations □ □ Solve quantum mechanical problems using special functions and polynomials. □ □ Apply Fourier series to simple circuits. □ □ To understand electromagnetic theory with Vector Calculus
TY Paper XII Sem VI	**INTEGRATED ELECTRONICS**	**Course Objectives:** · To study the different number systems associated with digital computation · To introduce the counters and registers. · To have in-depth knowledge in arithmetic operations of an operational amplifier. **Learning Outcomes:** On completion of the course the students will have: □ □ Through knowledge on different number systems □ □ The skill to simplify the logics using Karnaugh map and Boolean algebra □ □ Detailed knowledge in storing and retrieving a data through mux and demux □ □ The skill to customize the counters to the need through serial and parallel counters

TY Paper XIII Sem VI	**Microprocessor Fundamentals**	**Course Objective:** To study the architecture of the microprocessor 8085 and micro controller 8051 **Learning Outcome :** At end of the course, students will be able to: □ □ Describe the general architecture of a microcomputer system and architecture &organization of 8085 Microprocessor and understand the difference between 8085 and advanced microprocessor □ □ Understand and realize the Interfacing of memory & various I/O devices with 8085 microprocessor □ □ Understand and clasify the instruction set of 8085 microprocessor and distinguish the use of different instructions and apply it in assembly language programming. □ □ Understand the architecture and operation of Programmable Interface Devices and realize the programming & interfacing of it with 8085 microprocessor □ □ Understand the concepts of interrupts and microcontrollers

B.Sc., MATHS

Programme Outcomes(PO), Programme Specific Outcomes (PSO)and Course Outcomes (CO)at VESASC

Aided Section		
B.Sc., Programme MATHS PO: Apart from expertise in respective fields,aB.Sc students is imbibed with realization of human values,a sense of social service,becomes a responsible and dutiful citizen, deepls a critical temper and creative ability.		
PSO: The student undersands the basic concepts in maths and can apply them in the real world.He/She is also updates with the recent trends in subject.the student also builds a sound base for various post graduate courses in maths and related fields.		
Class / paper / Semester	**Title**	**Course outcome**
FIRST B.Sc Paper-I SEM -I	**ALGEBRA**	Students will acquire knowledge to Basic ideas on Theory of Equations, Matrices and Theory of Numbers. Knowledge to solve theoretical and applied problems
Paper-I SEM -I	**DIFFERENTIAL CALCULUS**	Students will acquire knowledge to The basics of differentiation and its applications. The notion of curvature, evolutes, involutes and polar co-ordinates.
ALLIED SEM -I	**PHYSICS-I**	Students will acquire knowledge to Explore the fundamental concepts of physics Import knowledge about the importance of material properties, heat, sound, optics, atomic and nuclear physics.

		Understand the energy involved in nuclear reaction Carry out the practical by applying these concepts Get depth knowledge of physics in day today life
Paper-III SEM -II	**TRIGONOMETRY**	Students will acquire knowledge Students will acquire knowledge to About the expansions of Trigonometric Functions, Hyperbolic Functions and sum of Trigonometric Series.
Paper-IV SEM -II	**INTEGRAL CALCULUS AND VECTOR ANALYSIS**	Integration and its geometrical applications, double, triple integrals and improper integrals. Vector differentiation and Vector integration.
ALLIED SEM -I	**PHYSICS-II**	Students will acquire knowledge to Acquire knowledge on elementary ideas of electricity and magnetism Emphasize the significance of laws involved in electric circuits Understand the basics of operational amplifier Apply the principles of electronics in day to life Apply the characteristics of electronic devices in practical's.

Paper-V SEM -III	**ANALYTICAL GEOMETRY**	Students will acquire knowledge to To analyze characteristics and properties of two and three dimensional geometric shapes. To develop mathematical arguments about geometric relationships. In Geometry and its applications in real world
Paper-VI SEM -III	**DIFFERENTIAL EQUATIONS**	Students will acquire knowledge to About the methods of solving Ordinary and Partial Differential Equations. To introduce Differential Equation as a powerful tool in solving problems in Science
ALLIED: MATHEMATICAL STATISTICS–I	**MATHEMATICAL STATISTICS–I**	Students will acquire knowledge to The laws of Probability and Baye's theorem. Measures of Location, Dispersion, Correlation and Regression The Discrete and Continuous Probability Distributions
Paper-VII SEM -IV	**TRANSFORM TECHNIQUES**	Students will acquire knowledge to About Laplace Transforms and its

		inverse To apply Laplace transform in solving Ordinary Differential Equations with constant coefficients, simultaneous Ordinary Differential Equations. To solve problems in Fourier series and Fourier transforms
Paper-VIII SEM -IV	**STATICS**	Students will acquire knowledge to Particles or body in rest under the given forces. Forces, equilibrium of a particle and centre of mass of various bodies.
ALLIED	**MATHEMATICAL STATISTICS–II**	Students will acquire knowledge to To provide the foundation of statistical analysis used in varied applications. Of Sampling methods, Tests of significance and testing of hypothesis.
Paper- SEM -V	**ALGEBRAIC STRUCTURES-I**	Students will acquire knowledge about the concepts of Sets, Groups and Rings.
Paper- SEM -V	**REAL ANALYSIS-I**	Students will acquire knowledge to Apply Mathematical concepts and Principles to perform numerical and symbolic computations. Understand and perform simple proofs. Know how abstract ideas and rigorous methods in Mathematical Analysis can be applied to practical problems.

Paper- XI SEM -V	**DYNAMICS**	Students will acquire knowledge to The motion of bodies under the influence of forces. Rectilinear motion of particles, Projectiles, Impact and Moment of Inertia of Particles
Paper- XII SEM -V	**DISCRETE MATHEMATICS**	Students will acquire knowledge to To apply tools and ideas in Mathematics for solving Applied Problems. To Evaluate Boolean functions and to express a logic sentence in terms of predicates, quantifiers, and logical connectives
ELECTIVE-I SEM -V	**NUMERICAL METHODS**	Students will acquire knowledge to Numerical techniques used as powerful tools in scientific computing. Linear, Algebraic and Transcendental equations and interpolation using finite difference formulae. Numerical Differentiation, Numerical Integration and Difference Equations
Paper- XIII SEM -VI	**ALGEBRAIC STRUCTURES-II**	Students will acquire knowledge to Students will acquire knowledge about the Vector Spaces, Dual spaces, Inner product spaces and

		linear transformations
Paper- XIV SEM -VI	**REAL ANALYSIS-II**	Students will acquire knowledge to The Real Numbers and the Analytic Properties of Real- Valued Functions. The Analytic concepts of Connectedness, Compactness, Completeness And Calculus.
Paper- XV SEM -VI	**COMPLEX ANALYSIS**	Students will acquire knowledge in Students will acquire knowledge about the basic ideas of analysis of Complex Functions in solving Complex Variables.
ELECTIVE-II SEM -VI	**GRAPH THEORY**	Students will acquire knowledge about To describe and apply some basic algorithms for graph. To model real world problems using graph theory.
ELECTIVE-III SEM -VI	**OPERATIONS RESEARCH**	Students will acquire knowledge to Solving Linear Programming Problems. Sequencing the jobs to be carried out based on Cost Optimization. Solving assignment and transportation problems and Queuing Theory Models.

B.Sc Biochemistry

PROGRAMME OUT COMES, PROGRAMME SPECIFIC OUTCOMES AND COURSE OUTCOMES

B.Sc Programme Biochemistry2014-2015

PO: After completing three years for Bachelors in biochemistry, students would gain, the application of chemistry to the study of biological processes at the cellular and molecular level. It emerged as a distinct discipline around the beginning of the 20th century when scientists combined chemistry, physiology, and biology to investigate the chemistry of living systems.

B.Sc

PSO: Biochemistry is the branch of science that explores the chemical processes within and related to living organisms. It is a laboratory based science that brings together biology and chemistry. By using chemical knowledge and techniques, biochemists can understand and solve biological problems.

Class/ paper/ semester	Title	Course Outcome
FIRST B.SC Paper I Sem I	CELL BIOLOGY	By understanding how cells work in healthy and diseased states, cell biologists working in animal, plant and medical science will be able to develop new vaccines, more effective medicines, plants with improved qualities and through increased knowledge a better understanding of how all living things live.
Paper II Sem I	CHEMSITRY I	Students gained the theoretical as well as practical knowledge of handling chemicals.
Paper III Sem II	CHEMISTRY OF BIOMOLECULES	Students will be able to understand, functioning of living organisms. These molecules perform or trigger important biochemical reactions in living organisms. When studying biomolecules, one can understand the physiological function that regulates the proper growth and development of a human body
Paper IV Sem II	CHEMISTRY II	Learn the laboratory skills and safely to transfer and interpret knowledge entirely in the working environment
SECOND B.SC Paper V Sem III	BIOCHEMICAL TECHNIQUES I	Understanding of the principles of analytical chemistry and their application in the areas of environmental and advanced materials. Depending on their program, students will have the opportunity to apply analytical chemical methods
Paper -VI Sem III	ZOOLOGY I	Training in the diversity, organismal biology, ecology, and evolution ofanimals
Paper VII Sem IV	BIOCHEMICAL TECHNIQUES II	Understanding of the principles of analytical chemistry and their application in the areas of environmental. Depending on their program, students will have the opportunity to apply analytical chemical methods

Paper VIII Sem IV	ZOOLOGY II	Students will able to knowledge, which specializes in the study of animals both living and extinct, including their anatomy and physiology, embryology, genetics, evolution, classification, habits, behavior and distribution
THIRD YEAR B.SC Paper IX Sem V	ENZYMES	Students will be able to knowledge, enzymes are able to speed up the rate of chemical reactions. Be able to the basic properties of enzymes. Be able to the components of a metabolic pathway.
Paper X Sem V	INTERMEDIARY METABOLISM	Students will be able to knowledge, their bioenergetics, physiological adaptation, metabolic and main hormonal regulation, localization and cellular compartmentalization. Correlate the metabolic activity of tissues and organs with their function.
PAPER XI Sem V	MOLECULAR BIOLOGY	Students will be to knowledge, the concepts of DNA replication, DNA damage and repair, and gene expression in eukaryotic and prokaryotic organisms
Paper XII Sem V	BIOTECHNOLOGY	Students will be able to knowledge, Invitro fertilization and embryo transfer technology. To get insight in applications or recombinant DNA technology in agriculture, production of therapeutic proteins. To describe commercial production of fuels, microbial enzymes. To explain the microbial degradation of pesticides, Bioremediation&Biofertilizers
PAPER -XIII SEM – VI	NUTRITIONAL BIOCHEMSITRY AND HUMAN RIGHTS	The students will be able to understand nutrition and healthy diet planning concepts. summarize the deficiencies of nutrition. The digestion, absorption and transports in blood circulation of nutrients
PAPER -XIV SEM – VI	CLINICAL BIOCHEMISTRY	Students will be able to know clinically assess the laboratory indicators of physiologic conditions and diseases. Students will know the biochemical and molecular tools needed to accomplish preventive, diagnostic, and therapeutic intervention on hereditary and acquired disorders
PAPER – XV SEM – VI	IMMUNOLOGY	Understand the overall organization of the immune system.
PAPER -XVI SEM – VI	PHYSIOLOGY	Basic knowledge of human anatomy and physiology. Develop a basic working vocabulary applicable to the study of anatomy and physiology.

B.Sc. Computer Science

Programme Outcomes (PO), Programme Specific Outcomes (PSO) and Course Outcomes (CO) at VESASC

B.Sc. Computer Science	1. The student gets familiar to various core technologies in IT industry such as programming, testing, operating system administration, networking, website designing, databases etc 2. The syllabus also covers subjects to develop soft skills of students which enables them to prepare better resume, interviews, leadership skills, etc. 3. This enables the student to get absorbed in the campus placement. 4. The syllabus prepares the students to prepare for certification courses	
Class/ Paper/ Semester	Title	Course Outcome
FYBSC CS SEM I	Programming in C	The objective of this paper is to introduce various concepts of programming to the students using C
FYBSC CS SEM I	**PRACTICAL – I PROGRAMMING IN C**	Understand the numeric or real life application problems and solve them. Apply a solution clearly and accurately in a program using C.
FYBSC CS SEM I	**ALLIED MATHEMATICS-I**	Students gain knowledge about basic concepts of Algebra, Theory of Equations, Matrices, Trigonometry and Calculus.
FYBSC CS SEM I	**Soft Skills Development**	To help learners develop their soft skills and develop their personality together with their technical skills. Understand various issues in personal and profession communication and learn to overcome them

FYBSC CS SEM I	**NON MAJOR ELECTIVE**	The findings from various researches on technology diffusion and ICT utilization and recent trends in education point out the importance of student factor in integration of technology into education.
FYBSC CS SEM II	**DIGITAL ELECTRONICS & MICROPROCESSORS**	Describe and introduces the concepts of fundamentals of Digital Electronics and Microprocessor. Describe the microstructure of a processor Demonstrate the ability to program a microprocessor in assembly language.
FYBSC CS SEM II	Practical II - Digital Electronics & Microprocessors Lab	Implement the truth table operations,binary bit operations Understand the programming logic of 8085 in various aspects
FYBSC CS SEM II	**ALLIED MATHEMATICS – II**	Students gain knowledge about basic concepts of Differential Equations, Laplace Transforms, Vector Analysis and Calculus.
FYBSC CS SEM II	**Soft Skills Development**	To help learners develop their soft skills and develop their personality together with their technical skills. Developing professional, social and academic skills to harness hidden strengths, capabilities and knowledge equip them to excel in real work environment and corporate life. Understand various issues in personal and profession communication and learn to overcome them

FYBSC CS SEM II	NON MAJOR ELECTIVE	The findings from various researches on technology diffusion and ICT utilization and recent trends in education point out the importance of student factor in integration of technology into education. Students' choice of how to use ICT is an important determinant that increases or decreases the benefit from ICT utilization
SYBSC CS SEM III	**PROGRAMMING IN C++ AND DATA STRUCTURES**	Functions to implement linear and non-linear data structure operations. Suggest appropriate linear and non-linear data structure operations for solving a given problem.
SYBSC CS SEM III	Soft Skills Development	To help learners develop their soft skills and develop their personality together with their technical skills. Developing professional, social and academic skills to harness hidden strengths, capabilities and knowledge equip them to excel in real work environment and corporate life. Understand various issues in personal and profession communicationand learn to overcome them
SYBSC CS SEM IV	**PROGRAMMING IN JAVA**	Students will be able to develop Java Standalone applications and Applets. Choose the appropriate data structure for modeling a given problem.
SYBSC CS SEM IV	**JAVA PROGRAMMING LAB**	Understand the numeric or real life application problems and solve them.Apply a solution clearly and accurately in a program using Java Develop Java Standalone applications and Applets.

SYBSC CS SEM IV	**Soft Skills Development**	To help learners develop their soft skills and develop their personality together with their technical skills. Developing professional, social and academic skills to harness hidden strengths, capabilities and knowledge equip them to excel in real work environment and corporate life. Understand various issues in personal and profession communicationand learn to overcome them
SYBSC CS SEM IV	**ENVIRONMENTAL STUDIES PROGRAMME**	**Students** will understand key concepts in the life and physical sciences and will apply them to environmental issues.
TYBSC CS SEM V	**OPERATING SYSTEM**	Understand the structure and functions of Operating System Compare the performance of Scheduling Algorithms Analyze resource management techniques
TYBSC CS SEM V	**DATABASE MANAGEMENT SYSTEM**	Describe basic concepts of database system Design a Data model and Schemas in RDBMS Competent in use of SQL Analyze functional dependencies for designing robust Database
TYBSC CS SEM V	**Computer Architecture and Organization**	Implement the arithmetic operations in assembly language programming Understand the programming logic of 8085 in various aspects
TYBSC CS SEM V	**ELECTIVE-I:** **VISUAL PROGRAMMING**	To inculcate knowledge on Visual Basic concepts and Programming Gain a working knowledge of various controls using visual programming

BCA COMPUTER APPLICATION

Programme Outcomes (PO), Programme Specific Outcomes (PSO) and Course Outcomes(CO) at VESASC

BCA COMOUTER APPLICATION	1. The student gets familiar to various core technologies in IT industry such asprogramming, testing, operating system administration, networking, websitedesigning, databases etc 2. The syllabus also covers subjects to develop soft skills of students which enables them to prepare better resume, interviews, leadership skills, etc. 3. This enables the student to get absorbed in the campus placement. 4. The syllabus prepares the students to prepare for certification courses	
Class/ Paper/ Semester	**Title**	**Course Outcome**
FYBCA SEM I	**FUNDAMENTALS OF DIGITAL COMPUTERS**	Describe and introduces the concepts of fundamentals of Digital Electronics
FYBCA SEM I	**PC SOFTWARE LAB**	• Demonstrate a basic understanding of computer hardware and **software**. • Demonstrate problem-solving skills. • Apply logical skills to programming in a variety of languages. • Utilize web technologies. • Present conclusions effectively, orally, and in writing.
FYBCA SEM I	**ALLIED MATHEMATICS-I**	Students gain knowledge about basic concepts of Algebra, Theory of Equations, Matrices, Trigonometry and Calculus.
FYBCA SEM I	**SOFT SKILLS DEVELOPMENT**	To help learners develop their soft skills and develop theirpersonality together with their technical skills. Understandvarious issues in personal and profession communicationand learn to overcome them

FYBCA SEM I	**NON MAJOR ELECTIVE**	The findings from various researches on technology diffusion and ICT utilization and recent trends in education point out the importance of student factor in integration of technology into education.
FYBCA SEM II	**PROGRAMMING IN C**	The objective of this paper is to introduce various concepts of programming to the students using C
FYBCA SEM II	**PRACTICAL – I** **PROGRAMMING IN C**	Understand the numeric or real life application problems and solve them. Apply a solution clearly and accurately in a program using C.
FYBCA SEM II	**ALLIED MATHEMATICS –II**	Students gain knowledge about basic concepts of Differential Equations, Laplace Transforms, Vector Analysis and Calculus.
FYBCA SEM II	**SOFT SKILLS DEVELOPMENT**	To help learners develop their soft skills and develop their personality together with their technical skills. Developing professional, social and academic skills to harness hidden strengths, capabilities and knowledge equip them to excel in real work environment and corporate life. Understand various issues in personal and profession communication and learn to overcome them
FYBCA SEM II	**NON MAJOR ELECTIVE**	The findings from various researches on technology diffusion and ICT utilization and recent trends in education point out the importance of student factor in integration of technology into education. Students' choice of how to use ICT is an important determinant that increases or decreases the benefit from ICT utilization
SYBCA CS SEM III	**PROGRAMMING IN C++** **AND DATA STRUCTURES**	Functions to implement linear and non-linear data structure operations. Suggest appropriate linear and non-linear data structure

		operations for solving a given problem.
SYBCA SEM III	**SOFT SKILLS DEVELOPMENT**	To help learners develop their soft skills and develop their personality together with their technical skills. Developing professional, social and academic skills to harness hiddenstrengths, capabilities and knowledge equip them to excelin real work environment and corporate life. Understand various issues in personal and profession communication and learn to overcome them
SYBCA SEM IV	**PROGRAMMING IN JAVA**	Students will be able to develop Java Standalone applications and Applets. Choose the appropriate data structure for modeling a given problem.
SYBCA SEM IV	**JAVA PROGRAMMING LAB**	Understand the numeric or real life application problems and solve them. Apply a solution clearly and accurately in a program using Java Develop Java Standalone applications and Applets.
SYBCA SEM IV	**COMPUTER GRAPHICS**	the core concepts of computer graphics, including viewing, projection, perspective, modelling and transformation in two and three dimensions. apply the concepts of colour models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering. interpret the mathematical foundation of the concepts of computer graphics.

SYBCA SEM IV	**OPERATING SYSTEM**	Understand the structure and functions of Operating System Compare the performance of Scheduling Algorithms Analyze resource management techniques
SYBCA SEM IV	**SOFT SKILLS DEVELOPMENT**	To help learners develop their soft skills and develop their personality together with their technical skills. Developing professional, social and academic skills to harness hiddenstrengths, capabilities and knowledge equip them to excelin real work environment and corporate life. Understand various issues in personal and profession communication and learn to overcome them
SYBCA SEM IV	**ENVIRONMENTAL STUDIES PROGRAMME**	**Students** will understand key concepts in the life and physical sciences and will apply them to environmental issues.
TYBCA SEM V	**DATABASE MANAGEMENT SYSTEM**	Describe basic concepts of database system Design a Data model and Schemas in RDBMS Competent in use of SQL Analyze functional dependencies for designing robust Database
TYBCA SEM V	**SOFTWARE ENGINEERING**	The students should be able to specify software requirements, design the software using tools To write test cases using different testing techniques.
TYBCA SEM V	**ELECTIVE-I:** **VISUAL PROGRAMMING**	To inculcate knowledge on Visual Basic concepts and Programming Gain a working knowledge of various controls using visual programming

TYBCA SEM V	**PART – IV - VALUE EDUCATION**	**Value**-based **education** is essential to develop an individual and help him/her lifelong in many ways.**Value education** also helps the **students** to become more and more responsible and sensible.
TYBCA SEM VI	**DATA COMMUNICATION AND NETWORKING**	Analyze different network models Describe, analyze and compare a number of data link, network and transport layer Analysing key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI
TYBCA SEM VI	**WEB TECHNOLOGY**	Understand the general concepts of HTML scripting language for the development with VBScript. Understand the basic functions of ASP.NET program and HTML concepts
TYBCA SEM VI	**PRACTICAL – VI -WEB APPLICATIONS LAB**	Students should be able to use javascript and vbscript tools for the designing the software and web applications
TYBCA SEM VI	**ELECTIVE II** **OBJECT ORIENTED ANALYSIS AND DESIGN**	• Specify, analyze and design the use case driven requirements for a particular system. • Identify, Analyze the subsystems, various components and collaborate them interchangeably.
TYBCA SEM VI	**SOFTWARE TESTING**	The students should be able to specify software requirements, design the software using tools To write test cases using different testing techniques.
TYBCA SEM VI	**MULTIMEDIA**	Developed understanding of technical aspect of multimedia system Understand various file format for audio, video and text media

BA ENGLISH

Class/Paper/ Semester	Title	Course Outcomes
FYBA PAPER I SEM I	BRITISH LITERATURE-I	Learning British literature style of plays. Understand the literary sensibility of British Literature.
FYBA PAPER II SEM I	INDIAN WRITING IN ENGLISH	Learning Indian Writers and their works.
FYBA ALLIED I SEM I	BACKGROUND TO THE STUDY OF ENGLISH LITERATURE-I	Learning social history of England explores the full breadth of English life and society.
FYBA NON MAJOR I SEM I	ENGLISH FOR COMPETITIVE EXAMINATION-I	Learning basic grammar of English.
FYBA SOFT SKILL I SEM I	COMPUTING SKILL-I	Learning basic skills of computer.
FYBA PAPER III SEM II	BRITISH LITERATURE-I	Learning about the British poets their style of writing in their own.
FYBA PAPER IV SEM II	REGIONAL INDIAN LITERATURE IN TRANSLATION	Learning about regional Indian translations which based on the society.
FYBA ALLIED II SEM II	BACKGROUND TO THE STUDY OF ENGLISH LITERATURE-II	To know the kinds of poetry and writings prose, fiction read with interpretive and analytical proficiency one or more creative literary genres.
FYBA NON MAJOR II SEM II	ENGLISH FOR COMPETITIVE EXAMINATION-II	Learning basic grammar and rules.
FYBA SOFT SKILL II SEM II	COMPUTING SKILL-II	Learning basic skills and knowledge about the computer.
SYBA PAPER V SEM III	BRITISH LITERATURE-III	To know the British literature changed the world and aftermath, caused major changes in the world.
SYBA PAPER VI SEM III	MODERN ENGLISH LANGUAGE AND USAGE	To understand modern linguistics is a science of linguistic study. This is the main difference between traditional grammar and linguistics.
SYBA ALLIED III SEM III	MYTH AND LITERATURE	To know about western culture and English literature.
SYBA SOFT SKILL III SEM III	PERSONALITY ENRICHMENT-I	Learning about self-development.
SYBA PAPER VII SEM IV	AMERICAN LITERATURE-I	Learning the American literature brought about historical social-political movements the revolutionaries.

SYBA PAPER VIII SEM IV	FILM AND LITERATURE	Learning study of literature in relation to art, film, theatre and music.
SYBA ALLIED IV SEM IV	INTRODUCTION TO THE STUDY OF LANGUAGE AND LINGUISTICS	To know about romantic poets brought a new emotionalism and introspection.
SYBA SOFT SKILL IV SEM IV	PERSONALITY ENRICHMENT-II	Leaning about proper goal setting to that self-esteem get changed.
TYBA PAPER IX SEM V	AMERICAN LITERATURE- II	Learning Shakespeare's original words into the language many of which we still use.
TYBA PAPER X SEM V	POST COLONIAL LITERATURE IN ENGLISH – I	Learning about modern language inculcates the essence of the Indian writing.
TYBA PAPER XI SEM V	WOMEN'S WRITING	Learning about the formal women's writings and their goals.
TYBA PAPER XII SEM V	AN INTODUCTION TO LITERARY THEORIES	Learning about the phonetics transcription.
TYBA ELECTIVE I SEM V	INTRODUCTION TO TRANSLATION STUDIES	The students will be able to trace the history and evolution of translation studies.
TYBA PAPER XIII SEM VI	CONTEMPORARY LITERATURE	Learning about the various literary genres and works of contemporary writers.
TYBA PAPER XIV SEM VI	POST COLONIAL LITERATURES IN ENGLISH-II	Learning early American and puritan literature.
TYBA PAPER XV SEM VI	SHAKESPEARE	Recollect features of Elizabethan theatre along with Shakespeare's life and works.
TYBA ELECTIVE II SEM VI	WORLD LITERATURE IN TRANSLATION	To understand the importance of devotion and dedication in human life.
TYBA ELECTIVE III SEM VI	JOURNALISM	Students will be able to apply basic and advanced human communication theories and models to academic and professional situations.
TYBA SOFT SKILL V SEM VI	VALUE EDUCATION	Students will understand the important of value based living.

BBA

PROGRAMME OUT COMES, PROGRAMME SPECIFIC OUTCOMES AND COUSE OUTCOMES ATVERSAC

BBA Programme

PO: Apart from expertise in respective fields, a BBA student is imbibed with realization of human values, a sense of social service, becomes a responsible and dutiful citizen, deelps a critical temper and creative ability.

BBA

PSO: The student understands the basic concepts in commerce and can apply them in the real world. He/She is also updated with the recent trends in the subject. The student also builds a sound base for various post graduate courses in Business Administration and related fields.

Class/ paper/ semester	Title	Course Outcome
FIRST BBA Paper I Sem I	FINANCIAL ACCOUNTING	The students will be able to analyze and prepare financial statement of different types of Organization. The students will be aware of the various amendments in financial reporting.
Paper II Sem I	PRINCIPLES OF MANAGEMENT	On the completion of syllabus students will understand the basic concepts and significance of management in business.
Paper III Sem I	MANAGERIAL ECONOMICS	will be able to grasp the micro-economic concepts.
Paper III Sem II	MANAGEMENT ACCOUNTING	To understand basic concepts, importance and methods of capital budgeting how to calculate working capital, different ratios, analysis and interpretation of financial statements. Students are exposed to basics of Auditing and Audit Process carried out by auditors in Ltd. Companies.
Paper IV Sem II	BUSINESS COMMUNICATION	Students Understand the concept of communication and familiarize with modern form of communication.
Paper v Sem II	INTERNATIONAL TRADE	The course provides understanding of International Trade, Commercial Policy and Global Finance as well as recent trends and developments in international trade
SECOND YEAR Paper I	FINANCIAL MANAGEMENT	Helps to understand importance of finance in business

Sem III		world.It also teaches the various sources through which finance can be raised & methods to maintain the finance in business.
Paper II Sem III	COMPUTER APPLICATIONS IN BUSINESS	Objectives: To understand the structure and operation of modern processors and their instruction sets
Paper III Sem III	ORGANISATIONAL BEHAVIOUR	understanding group and individual performance and activity within an organisation
Paper IV Sem III	MARKETING MANAGEMENT	The student will understand the new avenues available due to internet and also how the organisations use digital platform for marketing
Paper V Sem III	BUSINESS STATISTICS	Students will understand factorial notation, fundamental principle of counting, meaning of permutations and combinations and difference between them, different types of permutations and combinations Understand factorial notation, fundamental principle of counting, meaning of permutations and combinations and difference between them, different types of permutations and combinations. Organize, present and interpret statistical data, both numerically and graphically, the concept of interest and related term, computation of interest and annuity, present and future value, Use various methods to compute the probabilities of events, the meaning of bivariate data, the concept of correlation between two variables, concept of regression Be familiar with index numbers methods and have a detailed knowledge of the algebra. Be able to provide practical solutions to general aggregation problems. Understand the competing merits of different

		approaches to index number problems and methods for dealing with quality change and new goods, Solve basic problems in probability theory, including problems involving the binomial, Poisson, and normal distributions
Paper I Sem IV	HUMAN RESOURCES MANAGEMENT	The course provides understanding of Human Relations, Industrial Relations and Current Issues in HRM.
Paper II Sem IV	BUSINESS REGULATORY FRAME WORK	to get the insight on Indian Partnership Act, Factories Act
Paper III Sem IV	FINANCIAL SERVICES	Understanding of Basics of financial services, types of financial services and its role in Indian economy
Paper IV Sem IV	MANAGEMENT INFORMATION SYSTEM	The students can Interpret how information technology affects business operations, and utilize business technologies to their advantage.
Paper V Sem IV	OPERATION RESEARCH	The students are introduced to practical application of operations research in business
THEIR YEAR Paper I Sem V	ADVERTISING MANAGEMENT AND SALES PROMOTION	The students understand the Sales & Distribution functions as an integral part of marketing functions in a business firm
Paper II Sem V	RESEARCH METHODOLOGY	to learn research design, data collection, interpretation and report writing
Paper III Sem V	OPERATION MANAGEMENT	The goal of the operation management is to maximize efficiency while product goods and servicesthateeffectively fulfil customer needs.
Paper IV Sem V	MATERIAL MANAGEMENT	the goal of materials is to toprovide an unbroken chain of components for production to manufacturing goods on time for customers.
Paper V Sem V	ENTREPRENEURIAL DEVELOPMENT	The student will learn the role and importance of entrepreneurs in economic development and make

		and interpret the business plan
Paper I Sem VI	BUSINESS ENVIRONMENT	Students have an understanding of the Environment System, its significance and man- environment relationship. Students are sensitized to the environmental issues faced by the world and students realise the need for sustainable ways for living.
Paper II Sem VI	SERVICE MARKETING	The students will understand the concepts and techniques of marketing management and their application in rural marketing.
Paper III Sem VI	BUSINESS TAXATION	to get an insight on payment of indirect tax and refunds, filing of returns, documentation, audit and Customs Act.
Paper IV Sem VI	CUSTOMER RELATIONSHIP MANAGEMENT	helps to understand the relationship to be maintained between the customers and the banking and insurance organization for enhancing and expansion of the services to a wider market.
Paper V Sem VI	PROJECT WORK	The students will be carrying out a project work which involves practical understanding of the theoretical aspects

BBM (BANK MANAGEMENT)

PROGRAMME OUT COMES, PROGRAMME SPECIFIC OUTCOMES AND COUSE OUTCOMES AT VERSAC BBM(BANK MANAGEMENT)

PO: Apart from expertise in respective fields, a BBM (bank management) student is imbibed with realization of human values, a sense of social service , becomes a responsible and dutiful citizen, deelps a critical temper and creative ability,

BBM (bank management),

PSO: The student understands the basic concepts in commerce and can apply them in the real world. He / She is also with the recent trends in the subject. The student also builds a sound base for various post graduate courses in commerce and related fields.

Class / paper/ semester	Title	Course Outcome
FIRST BBM Paper I Sem I	FINANCIAL ACCOUNTING	The students will be able to analyze and prepare financial statement of different types of organization The students will be aware of the various amendments in financial reporting
Paper II Sem I	BUSINESS COMMUNICATION	Students understand the concept of communication and familiarize with modern form of communication
Paper III Sem I	BUSINESS ECONOMICS	Students understand the concept of communication and familiarize with modern form of communication
Paper IV Sem II	PRINCIPLES OF MANAGEMENT	The students will be able to understand basic concepts of management
Paper V Sem II	PRACTICAL AUDITING	The students understand the concept present day Auditing Students to gain knowledge of various techniques of auditing
Paper VI Sem II	INTERNATIONAL ECONOMICS	The students will able to analyze and prepare economics of different types of international economics
SECOND BBM Paper I Sem III	CORBORATE ACCOUNTING	The students understand the Preparation of the Company accounts. Students will able to understand the various Provisions of the Companies Act.
Paper II Sem III	BUSINESS LAW	The students develop the Provisions of law governing General Contract and Special Contract The students understand the Legal Remedies available in the Law to the Business and other People
Paper III Sem III	BANKING THEORY LAW & PRACTICE	The students understand the origin and the growth of Indian Banking and the modern day Developments in the Indian Banking Sector
Paper IV Sem III	MANAGEMENT ACCOUNTING	The students gain knowledge about the various techniques of Management and the Principles of management .
Paper V Sem III	INDIAN ECONOMY I	The students understand the concept of micro and macro economics
Paper VI Sem IV	ADVANCED CORPORATE ACCOUNTING	The students understand the Preparation of the Company accounts in advance,
Paper VII Sem IV	COMPANCY LAW	The students understand provisions governing the company law and aware on the recent amendments to Company Acts.
Paper VIII Sem IV	FINANCIAL SERVICE	The students understand various financial service and will be able to analyze Financial Service in India
Paper IX	INDIAN ECONAMY II	The students understand the concept of micro and macro

Sem IV		economics and will be aware of various sources of economy
Paper X Sem IV	ENVIRONMENTAL STUDIES	Students can able to aware about the environmental protection Act and to prevent the pollution from the earth
THIRD BBM Paper I Sem V	INCOME TAX LAW AND PRACTICE I	Students understand the various provisions of income tax, assessment procedure and tax planning.
Paper II Sem V	BANKING THEORY AND REGULATORY MACHANISIM	Students understand the concept of the banking structure and the relationship between banking theory reforms and monetary policy
Paper III Sem V	PORTFOLIO MANAGEMENT	Students gain knowledge on the concept of portfolio management and techniques
Paper IV Sem V	INTERNATIONAL BANKING	Students understand the concept of international banking structure and the role of foreign exchange management
Paper V Sem V	VISUAL BASIC (THEORY)	Students understand the techniques of visual basic programming language
Paper VI Sem VI	MARKETING OF BANKING SERVICE	Students understand the application of marketing principles in banking sector
Paper VII Sem VI	TECHNOLOGY IN BANKING	Students learning the role of technology in banking sectors and the concept of application of technology in banking sector
Paper VIII Sem VI	INCOME TAX LAW & PRACTICE II	Students gain knowledge about the relevance and significance of tax and the provision of Income Tax
Paper IX Sem VI	TREASURY MANAGEMENT	Students understand the concept of treasury management and the mechanism of treasury management
Paper X Sem VI	VISUAL BASIC (PRACTICAL)	Students practically understand the usage of visual basic programming through computer

PROGRAMME OUT COMES, PROGRAMME SPECIFIC OUTCOMES AND COURSE OUTCOMES

B.A., TAMIL Programme

PO: Programme Outcomes Upon completion of the B.A. Degree Programme, the graduate will be able to explain letters, words and grammar in the tamil language to understand the history and culture. To explain ethnic word difference between valimikum, valimika places and in sentence making. Learn about journalism to learn about the speciality of short stories, learn about speciality of minor literature.

PSO: Programme Specific Outcomes Upon completion of these courses the student would understand the letters, words and grammar, understand the history and culture of Sangam tamil people, recognize the different valimikum, valimika formation of sentences, learn the origin of Journalism, understand the art involved in writing short stories and novels, understand the speciality of codes in minority literature.

Class/ paper/ semester	Title	Course Outcome
FIRST B.A Paper I Sem I	Ikkala Ilakkiyam	To recognize the poet's poetry and ideas adopted in traditional culture. To learn about the instances in the family structure. To recognize and explain the Biography of Buddha. To explore the social values of short stories. To explore the social values of novels and develops creative skills.
Paper II Sem I	Puraporul Venbamalai	The students will review the type and format of writing. Rememberthe life styles of the Sangam period. Understand the heroic spirit of the ancient tamil kings. Able to evaluate the social status of women, and understand their divine aspects. Be able to live a life pleasing ones self and others . Be able to compare World literature,General literature and National Llliterature.
Sub Subject – III Sem 1	Tamilaga Varalarum Panpadum	To learn about the culture and history of Tamil Nadu. To learn about the culture, warfare, arts and social status of the Sangam age. To evaluate the ruling system of Pallava and Nayakkar. To relate the Cherar, Chola, Pandias warfare, political positions and temple functions. To learn about the status of Tamil Nadu before and after Independence
Paper IV Sem II	Ara Ilakkiyangal	Awareness of the importance of Thirukkural in World Literature Gain grammatical knowledge of the subject Knowledge of the script writer's rhetoric Compare Thirukkural with other literatures Knowledge of the Components of Porutpall

Paper V Sem II	Nambiyagaporul	To learn about the grammar its types and its usage. To recognize the grammar of the conjunction and adjective. To learn the grammar categories and their types. To learn the adjective, its evaluation on the types and properties of organisms. Instructing Yap and Ani to the students
Paper VI Sem II	Tamil Ilakkiya Varalaru	Learn to grow through the twelve Thirumuraigal of religion. Evaluate the devotional literature through Andal songs. Learn to review the devotional songs Learn the lyrics of spiritual songs. Explore the excellence of learning shorthand.
SECOND BA., Paper VII Sem III	Nannool	Obtaining the ability to legitimate the neo-rhetorical nematodes with the help of lectures . understanding the post grammar facing the future focusing on knowledge criticism . To learn the grammatic usage of a noun. To learn about the grammar its types and its usage. To recognize the grammar of the conjunction and adjective. To learn the grammar categories and their types. To learn the adjective, its evaluation on the types and properties of organisms. Instructing Yap and Ani to the students
Paper –VIII Sem III	Kappiyangal	Analyze the importance of Silapathikaram based on family values. Evaluate how women are elevated to the stature of Goddesses. Understand how Jealousy leads to destruction. Learn how to attain God's love through purity Develop a humanitarian spirit.
Sub Subject IX Sem III	Nattupuraviyal	Understand the value of family through folkore Aware of the importance, lifestyles and customs of folklore. Evaluate the value of folk story - telling and songs. Understand the rituals from birth to death and the importance of natural medicine through conversation. Participate in worshipping God and festivals etc..
Paper X Sem IV	Nannool	Obtaining the ability to legitimate the neo-rhetorical nematodes with the help of lectures . understanding the post grammar facing the future focusing on knowledge criticism . To learn the grammatic usage of a noun. To learn about the grammar its types and its usage. To recognize the grammar of the conjunction and adjective. To learn the grammar categories and their types. To learn the adjective, its evaluation on the types and properties of organisms. Instructing Yap and Ani to the students
Paper XI Sem IV	Bakthi Ilakkiyam	Religion has always been a big patron of art and literature in most languages, and much of the earliest literature in most languages now extant is religious or philosophical in character. But the

		Sangam poetry and other early works of Tamils refer less to religion than to social customs and traditions. A strong secular character seems to have influenced Tamil poetry in the early period.
Paper XII Sem IV	Thagaval Thodarpiyal	understand the letters, words and grammar. understand the history and culture of Sangam tamil people. recognize the different valimikum, valimika formation of sentences. learn the origin of Journalism. understand the art involved in writing short stories and novels. understand the speciality of codes in minority literature.
THIRD YEAR B.A., Paper XIII Sem V	Sitrilakkiyangal	Knowing the saiva vaishnava scriptures . To make the students to understand Corcuvai , Porutcuvai ,and Yap. Learn to grow through the twelve Thirumuraigal of religion. Evaluate the devotional literature through Andal songs.
Paper XIV Sem V	Ilakkanam 5 Yappu	Obtaining the ability to legitimate the neo-rhetorical nematodes with the help of lectures . understanding the post grammar facing the future focusing on knowledge criticism . To learn the grammatic usage of a noun. To learn about the grammar its types and its usage. To recognize the grammar of the conjunction and adjective. To learn the grammar categories and their types. To learn the adjective, its evaluation on the types and properties of organisms. Instructing Yap and Ani to the students
PAPER XV Sem V	Thravida Mozhigalin Oppilakkanam	Recognize that Tamil is one of the classical languages. Gain values for life through classical literature. Understand the importance of Classical Tamil literature. List out the various Tamil classical books. Understand the ancient features and importance of myth of Tamil classical writing.
Paper XVI Sem V	Ilakkiya Thiranayvu	Learn to write poetry Learn to approach drama in critical manner. Learn to evaluate Christian doctrine. Realizethe notion of lack of permanence in life. Analyse the service rendered by Christian clergyman towards Tamil.
Viruppapadam Paper XVII Sem V	Agarathiyiyal	Understanding the culture and traditions of the Tamil people. Learning ethical values through spirituality. Find answers to various questions through the study of myths, grammar and minor literatures. Developing a versatility in learning. Enhancing reading skills.
Paper XVIII Sem VI	Sanga Ilakkiyam	To analyze Sangam literature Analyze the external principles that has shaped Sangam Literature Analyze the internal principles that has shaped

		Sangam Literature. Understand the classical language and its importance Know how to review the impact of Sangam Literature on Present day Tamil Literature. To make the student aware of the highs and lows of romantic biographical elements of the songs in eight and ten songs.
Paper XIX Sem VI	Thandi Alangaram	Obtaining the ability to legitimate the neo-rhetorical nematodes with the help of lectures . understanding the post grammar facing the future focusing on knowledge criticism . To learn the grammatic usage of a noun. To learn about the grammar its types and its usage. To recognize the grammar of the conjunction and adjective. To learn the grammar categories and their types. To learn the adjective, its evaluation on the types and properties of organisms. Instructing Yap and Ani to the students
Paper XX Sem VI	Padaippilakkiyamum Mozhi Peyarppum	Understand the creativity, lifestyle and the culture of other language authors. Develop the skill of creative writing – especially short stories. Learning and analyzing translated novels. Learning foreign dramas and applying them in their day-today life. Gain an understanding of Greek spirituality, culture and tradition.
Paper XXI Sem VI	Tamilar Azhagu Kalaigal	Understand the self work of women ,feminism and the importance of women education Evaluatwe the status of women in tamil literature from the ancient times. Find solutions to women's problem through law. Evaluate women's perspectives through reviews. Examine the role of women achievers in the society.
Paper XXII Sem VI	Kaniniyum Inaiyamum	Understand the importance of the Computer Application of communication network in information technology Explore the Teaching methods Develop individual skills in teaching and learning Develop communication skills

B.COM

PROGRAMME OUT COMES, PROGRAMME SPECIFIC OUTCOMES AND COURSE OUTCOMES

B.COM Programme

PO: After completing three years for Bachelors in commerce program, students would gain a thorough grounding in the fundamentals of commerce and Finance.

B.com

PSO: Students will be able to demonstrate progressive learning of various tax issues and tax forms related to individuals, students will be above to demonstrate knowledge in setting up a computerized set of accounting books.

Class/ paper/ semester	Title	Course Outcome
FIRST B.COM Paper I Sem I	FINANCIAL ACCOUNTING	The students will be able to analyze and prepare financial statement of different types of Organization. The students will be aware of the various amendments in financial reporting.
Paper II Sem I	BUSINESS COMMUNICATION	Students Understand the concept of communication and familiarize with modern form of communication.
Paper III Sem I	BUSINESS ECONOMICS	Students understand the concept of communication and familiarize with modern form of communication.
Paper III Sem II	ADVANCED FINANCIAL ACCOUNTING	The students will be able to understand the preparation of financial statements for business units other than corporate undertaking and their utility.
Paper IV Sem II	PRINCIPLES OF MANAGEMENT	On the completion of syllabus students will understand the basic concepts and significance of management in business.
Paper -II Sem II	INDIAN ECONOMY	After completion of the syllabus students well versed with the features of Indian economy and known the five-year plans.
SECOND B.COM Paper V Sem III	CORPORATE ACCOUNTING -I	The students will learn the accounting procedures of corporate undertaing and their financial statement preparations.
Paper VI Sem III	BUSINESS LAWAS	On the completion of the syllabus students will understand the basic provisions of Law, contract and legal remedies in the law.
Paper VI Sem III	BANKING THEORY Law and Operations	After completion of this subjects students the growth of Indian of Indian Banking systems and their Modern Day Development.
Paper VIII Sem III	MARKETING	The students will understand the basic concepts of Marketing, Market segmentation Marketing Mix and Recent trends in Marketing.
PAPER III Sem III	Business Statistics and O.R -I	The students will be understand the statistics introduction and formulas and interpretations'.
Paper IX Sem IV	ADVANCED CORPORATE ACCCOUNTING	The students will be able to understand the procedures of corporate restructuring and to prepare the various accounting statements.
Paper X Sem IV	COMPANY LAW	The students will be able to understand company registration, Prospectus and alteration and liquidation.
Paper XII Sem IV	FINANCIAL SERVICES	The students will be above to understand financial market, financial instruments, financial banks.

Paper IV Sem -- IV	Business Statistics &O. R - II	The students will be understanding the statistics introduction and formulas and interpretations.
THIRD YEAR B.COM PAPER -XIII SEM – V	COST ACCOUNTING	The students will learn the accounting procedures of costing undertaing and their cost statement preparations.
PAPER -XIV SEM – V	PRACTICAL AUDITING	On the completion of the syllabus students will understand the basic provisions of Law, contract and legal remedies in the law.
PAPER – XV SEM – V	ENTREPREURIAL DEVELOPMENT	On the completion of syllabus students will understand the basic concepts and significance of management in business.
PAPER -XVI	FINANCIAL MANAGEMENT	The students will be able to analyze and prepare financial statement of different types of Organization. The students will be aware of the various amendments in financial reporting.
PAPER – XVII SEM - VI	ADV.COST ACCOUNTING	The students will learn the accounting procedures of costing undertaing and their cost statement preparations.
PAPER – XVIII SEM - VI	MANAGEMENT ACCOUNTING	The students will be able to understand the procedures of crestructuring and to prepare the various accounting statements.
PAPER – XIX SEM - VI	BUSINESS ENVIRONMENT	On the completion of syllabus students will understand the basic concepts and significance of business environment.

M.Sc. INFORMATION TECHNOLOGY

Programme Outcomes (PO), Programme Specific Outcomes (PSO) and Course Outcomes(CO) at VESASC

M.Sc. INFORMATION TECHNOLOGY	1. The student gets familiar to various core technologies in IT industry such asprogramming, testing, operating system administration, networking, websitedesigning, databases etc 2. The syllabus also covers subjects to develop soft skills of students which enables them to prepare better resume, interviews, leadership skills, etc. 3. This enables the student to get absorbed in the campus placement. 4. The syllabus prepares the students to prepare for certification courses	
Class/ Paper/ Semester	**Title**	**Course Outcome**
FYMSC IT SEM I	**PROGRAMMING IN C++ AND DATA STRUCTURES**	Functions to implement linear and non-linear data structure operations. Suggest appropriate linear and non-linear data structure operations for solving a given problem.
FYMSC IT SEM I	**VISUAL PROGRAMMING**	To inculcate knowledge on Visual Basic concepts and Programming Gain a working knowledge of various controls using visual programming
FYMSC IT SEM I	**Practical – III: RDBMS Lab**	Design a Data model and Schemas in RDBMS.Competent in use of SQL.Analyze functional of data normalization.
FYMSC IT SEM I	**DATABASE MANAGEMENT SYSTEM**	Describe basic concepts of database system Design a Data model and Schemas in RDBMS Competent in use of SQL Analyze functional dependencies for designing robust Database

FYMSC IT SEM I	**COMPUTER ARCHITECTURE AND ORGANIZATION**	Implement the arithmetic operations in assembly language programming Understand the programming logic of 8085 in various aspects
SYMSC IT SEM II	**PROGRAMMING IN JAVA**	Students will be able to develop Java Standalone applications and Applets. Choose the appropriate data structure for modeling a given problem.
SYMSC IT SEM II	**OPERATING SYSTEM**	Understand the structure and functions of Operating System Compare the performance of Scheduling Algorithms Analyze resource management techniques
SYMSC IT SEM II	**SOFTWARE ENGINEERING**	The students should be able to specify software requirements, design the software using tools To write test cases using different testing techniques.
SYMSC IT SEM II	**MULTIMEDIA**	Developed understanding of technical aspect of multimedia system Understand various file format for audio, video and text media
FYMSC IT SEM III	**DESIGN AND ANALYSIS OF ALGORITHMS**	Analyze the correctness of algorithms using inductive proofs and invariants. Analyze worst-case running times of algorithms using asymptotic analysis.
FYMSC IT SEM III	**ADVANCED JAVA PROGRAMMING**	Students will be able to develop Java Standalone applications and EJB using JDBC servlets.Choose the appropriate data structure for modeling a given problem.
FYMSC IT SEM III	**INFORMATION SECURITY**	Students must be able to analyze and design the problem in system software

FYMSC IT SEM III	**PRACTICAL – I: ADVANCED JAVA PROGRAMMING LAB**	Understand the numeric or real life application problems and solve them.Apply a solution clearly and accurately in a program using EJB using JDBC servlets
FYMSC IT SEM III	**COMPUTER GRAPHICS**	the core concepts of computer graphics, including viewing, projection, perspective, modelling and transformation in two and three dimensions. apply the concepts of colour models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering. interpret the mathematical foundation of the concepts of computer graphics.
FYMSC IT SEM III	**COMPUTER NETWORKS**	Analyze different network models Describe, analyze and compare a number of data link, network and transport layer Analysing key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP
SYMSC IT SEM IV	**PROJECT & VIVA-VOCE**	The aim of the project & viva-voce is that the student has to understand the real time software development environment. The project work is to be carried out either in a software industry or in an academic institution for the entire semester and the report of work done is to be submitted to the University

M.Sc Biochemistry

PO: After completing two years for Master in biochemistry, Study of Biochemistry has good scope like in teaching in medical and dental college, clinical research, pharma industry, pathology labs, nutrition biochemistry, etc. There is lot of scope abroad also. students take up MSc Biochemistry in order to better understand the chemical processes which deal with living organisms.

M.Sc

PSO: students take up MSc Biochemistry in order to better understand the chemical processes which deal with living organisms. It is a laboratory based science that brings together biology and chemistry. By using chemical knowledge and techniques, biochemists can understand and solve biological problems.

Class/ paper/ semester	Title	Course Outcome
FIRST M.SC Paper I Sem I	BIOMOLECULES	Students will be able to, importance of chemical foundation in living organisms.Analyze the various types of weak interactions between the biomolecules and water.correlate how the large biomolecules such as proteins, carbohydrates, lipids, nucleic acids are made from the simple precursors. Interpret the structure-function relationships of the proteins, carbohydrates, lipids, and nucleic acids.
Paper II Sem I	BIOCHEMICAL TECHNIQUES	Students will be able to, explain mechanistically isolation, purification, quantification techniques of biomolecules.perform procedure to characterize the biomolecules. perform of characterization of cells and cellular components using microscopy and flow cytometry.
Paper III Sem I	PHYSIOLOGY AND CELL BIOLOGY	Students will be able to,overall architecture of prokaryotic and eukaryotic cells and their internal structures including organelles. assess the importance of various stages of cell cycle, and their regulation.Interpret the importance of cellular differentiation in the overall development of an organism.some of the vital processes like circulation of blood, digestion, excretion.Analyze the role of the respiratory systems, endocrine glands, neuronal networks. To be familiar with the biochemical processes involved in photosynthetic carbon reduction in plants.
Paper IV	MICROBIOLOGY	students will be able to, identify and classify

Sem I		different members of microbial world. Understand the origin and evolution of microorganisms and major microbial habitats Recognize the relationship between microorganisms and disease. Reveal catabolic and anabolic process of micro organisms. Predict how virus and microorganisms interact with host cells and the way in which diseases arise
Paper V Sem II	ENZYMES AND ENZYME TECHNOLOGY	Students will be able to, Understand the basic principle of functioning of various enzyme the biological systems. Lear the calculation of kinetics parameter of the enzymes that will help them in handson training in the industry. Know the interaction of various inhibitor and medicine at biochemical level.Find out how artificial enzyme can be developed that will be current need the industry.
Paper -VI Sem II	INTERMEDIARY METABOLISM I	Students will be able to, draw or describe the structure of amino acids, proteins, enzymes, chemical messengers, carbohydrates, lipids, and nucleic acids.
Paper VII Sem II	INTERMEDIARY METABOLISM II	Students will be able to, discuss their bioenergetics, physiological adaptation, metabolic and main hormonal regulation, localization and cellular compartmentalization. Correlate the metabolic activity of tissues and organs with their function.
Paper VIII Sem II	ENERGY AND DRUG AND METABOLISM	Students will be able to, biochemical changes that obey the basic thermodynamic principles.correlate how the living organisms exchange energy and matter with the surroundings for their survival, and store free energy in the form of energy-rich compounds. Recognize how the catabolic breakdown of the substances is associated with release of free energy; whereas, free energy is utilized during synthesis of biomolecules i.e., anabolic pathways.Assess the crucial role of some hormones with regard to the integration of metabolic pathways. Apply the knowledge of metabolic pathways to biotechnological and biochemical research.

SECOND M.SC Paper IX Sem III	BIOTECHNOLOGY	Students will be able to, apply knowledge of cell biology and molecular Biology in various cellular functions, inculcate a knowledge of various issues related to molecular cell biology, the application and research involved in functioning of the different cell organelles. CO2 Design and analyze the experiments related with the different molecules involved in cell biology and use of the various techniques in the molecular cell biology to study the kinetics and rationale behind each phenomenon
Paper X Sem III	CLINICAL BIOCHEMISTRY I	Students will be able to, understand the molecular and biochemical basis of human diseases. know the fundamental deviation in biochemistry between metabolisms of healthy and diseased person. Acquire the basic knowledge about the diagnostic and prognostic tests for different diseases. Design small projects for their summer or other training.
PAPER XI Sem III	MOLECULAR BIOLOGY	Students will be able to, analyze the architecture of prokaryotic and eukaryotic genome, and salient features of the gene. central dogma of molecular biology, and the essential details of some basic biological processes such as replication, transcription, translation, and the regulation of gene. Apply the principles of various metabolic pathways for generation of commercially useful products.
Paper XII Sem III	BIOSTATICSTICS	Students will be able to, organize, summarize and display quantitative data and design to address public health and clinical problems.calculate summary estimates, measures of variability and confidence intervals. manipulate probabilities and the Normal and Binomial distributions
PAPER -XIII SEM – VI	HORMONES	Student will be able to knowledge, describe mammalian sexual development and explain the factors that control it.The hormonal control of the female reproductive cycle and of the male and female sexual behavior. Role of pheromones in reproductive physiology and sexual behavior.Discuss the activational effects of gonadal hormones on

		the sexual behavior of woman and men.
PAPER -XIV SEM – VI	CLINICAL BIOCHMEISTRY II	Students will be able to, recognize the growing importance of automation in clinical biochemistry.Be familiar with various endocrine systems, hormones, and their role in nutrition. Apply the steps of biochemical/clinical tests for disease diagnosis.
PAPER – XV SEM – VI	SIGNAL TRANSDUCTION	Students will be able to, the transmission of molecular signals from a cell's exterior to its interior. Signals received by cells must be transmitted effectively into the cell to ensure an appropriate response. This step is initiated by cell-surface receptors.
PAPER -XVI SEM – VI	IMMUNOCHMEISTRY	Students will be able to, explain the role of immune cells and their mechanism in body defense mechanism.Apply the knowledge of immune associated mechanisms in medical biotechnology research.Adopt immunological techniques for industrial uses.Demonstrate the association of immune system with cancer, autoimmunity, transplantation and infectious disease.Find out new vaccine target and develop strategy to design new vaccine.

M.COM

PROGRAMME OUT COMES, PROGRAMME SPECIFIC OUTCOMES AND COUSE OUTCOMES

PO: After completing two years for Master of commerce program, students would gain a thorough grounding in the details of commerce and Finance.

M.com

PSO: Students will be able to demonstrate progressive learning of various tax issues and tax forms related to individuals, students will be above to demonstrate knowledge in setting up a computerized set of accounting books.

Class/ paper/ semester	Title	Course Outcome
FIRST M.COM Paper I Sem I	Advance Corporate Accounting	The students will be able to understand the procedures of corporate restructuring and to prepare the various accounting statements.
Paper 2 Sem I	Financial Management	The students will be able to analyze and prepare financial statement of different types of Organization. The students will be aware of the various amendments in financial reporting.
Paper 3 Sem I	Organizational Behavior	The students are getting knowledge on employees' behavior and their managerial implication and to impart knowledge on organizational dynamics
Paper 4 Sem I	Managerial Economics	The students will be knowledgeable and expertise in the application of economic theories and concepts to business decisions
Paper 5 Sem II	Advance cost & Management accounting	The students will learn the accounting procedures of costing undertaing and their cost statement preparations and the students will be able to understand the procedures of crestructuring and to prepare the various accounting statements.
Paper 6 Sem II	Quantitative techniques for business decisions	The students are knowledge in quantitative methods and application and to offer expertise in quantitative analysis
Paper 7 Sem II	Marketing of services	The students are getting specialized knowledge on marketing skills for service sector and to expose students to marketing practices in service sector
Paper 8 Sem II	Total Quality Management	The students will learn expert knowledge in the emerging total management techniques and to build conceptual clarity and skill of concept applications

SECOND M.COM Paper 9 Sem III	Research Methodology	The students will be learn on research methods, techniques and the process of data collection processing and analysis of data
Paper 10 Sem III	Knowledge Management	The students understand managing human resources in organization and to provide for management tools.
Paper 11 Sem III	Fundamental of information technology	Students will be develop skills in computer application and to develop working knowledge.
Paper 12 Sem III	Business ethics, corporate governance & social responsibility	The students will understand among ethical issues in business and good governance
Paper 13 Sem IV	Management information system	Students are learn depth knowledge system in business and their management
Paper 14 Sem IV	Investment analysis and portfolio theory	The students will be able to develop knowledge on basic of investment management and to develop skill for investment analysis
Paper 15 Sem IV	Merchant banking and financial services	Students understand the conceptual understanding and in-depth knowledge of merchant banking
Paper 16 Sem IV	Financial Derivatives	Student understand the financial derivatives and to provide knowledge on accounting for derivatives.
Paper 17 Sem IV	Financial markets and institutions	The students will be aware of the financial markets and institutions and to impart knowledge on financial markets and institutions

PROGRAMME OUT COMES, PROGRAMME SPECIFIC OUTCOMES AND COURSE OUTCOMES

M.A., TAMIL Programme

PO: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives. Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PSO: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives. Curricular Provision: Core/Major papers PO2: Patriotism & Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

Class/ paper/ semester	Title	Course Outcome
FIRST M.A Paper I Sem I	Ikkala Ilakkiyam	To recognize the poet's poetry and ideas adopted in traditional culture. To learn about the instances in the family structure. To recognize and explain the Biography of Buddha. To explore the social values of short stories. To explore the social values of novels and develops creative skills.
Paper II Sem I	Ara Ilakkiyam	Awareness of the importance of Thirukkural in World Literature Gain grammatical knowledge of the subject Knowledge of the script writer's rhetoric Compare Thirukkural with other literatures Knowledge of the Components of Porutpall
Sub Subject – III Sem 1	Sitrilakkiyam	Knowing the saiva vaishnava scriptures . To make the students to understand Corcuvai , Porutcuvai ,and Yap. Learn to grow through the twelve Thirumuraigal of religion. Evaluate the devotional literature through Andal songs.
Paper – IV Sem 1	Tholkappiyam Porul 1	Gain knowledge about grammer and its characteristics Learn psychodynamic and psychological Literature Learn about the feminine characteristics through illustrations, images and parables Able to identify Collective nouns, feminine and masculine gender. Learn about Uvamai, Urubugal, Uvamaboli
Viruppapadam Sem 1	Koilkalaiyum Panpadum	Learn about the history and culture of Tamil Nadu and contribute to the Tamil art forms. Analyzing the traditional norms of the Tamil people. Evaluate the art forms of the Tamil people. Impart spiritual and religious ideas in the learners Understand the influence of the culture and lifestyles of foreign

		culture upon the Tamil people. To introduce the students about the tradition of Tamils and the sculptures of the temples and the devotion of the temples.
Paper V Sem II	Ikkala Ilakkiyam	To recognize the poet's poetry and ideas adopted in traditional culture. To learn about the instances in the family structure. To recognize and explain the Biography of Buddha. To explore the social values of short stories. To explore the social values of novels and develops creative skills.
Paper V I Sem II	Bakthi Ilakkiyam	Learn about the history and culture of Tamil Nadu and contribute to the Tamil art forms. Analyzing the traditional norms of the Tamil people. Evaluate the art forms of the Tamil people. Impart spiritual and religious ideas in the learners Understand the influence of the culture and lifestyles of foreign culture upon the Tamil people. Knowing the saiva vaishnava scriptures . To make the students to understand Corcuvai , Porutcuvai ,and Yap. Learn to grow through the twelve Thirumuraigal of religion. Evaluate the devotional literature through Andal songs.
Paper VII Sem II	Kappiyam	Analyze the importance of Silapathikaram based on family values. Evaluate how women are elevated to the stature of Goddesses. Understand how Jealousy leads to destruction. Learn how to attain God's love through purity Develop a humanitarian spirit.
Paper VIII Sem II	Tholkappiyam Porul 2	Gain knowledge about grammer and its characteristics Learn psychodynamic and psychological Literature Learn about the feminine characteristics through illustrations, images and parables Able to identify Collective nouns, feminine and masculine gender. Learn about Uvamai, Urubugal, Uvamaboli
Viruppapadam Sem II	Sutrulaviyal	Study the art of guiding tourists. Learn the rules and regulations of the tourist industry Understand the role of organizational management Come to know about the developments in the tourism board. Evaluate the importance of tourism
SECOND MA., Paper IX Sem III	Sanga Ilakkiyam	To analyze Sangam literature Analyze the external principles that has shaped Sangam Literature Analyze the internal principles that has shaped Sangam Literature. Understand the classical language and its importance Know how to review the impact of Sangam Literature on Present day Tamil Literature
Paper X	Tholkappiyam Ezhuthu	Understand the Grammer used in Tholkappiyam

Sem III		Understand and practice the methods of writing without errors. Learn to evaluate thealphabets . Learn to explore the origins of writing. Learn new meanings through the coinage of words.
Paper XI Sem III	Tholkappiyam Soll	Learn to review the paper, Gender, Number, Location, Case, Question and answer. Learn the names of differentimages and its discriminations. Evaluate the grammer of the verbs, hypotheticalusage andits noun types. Recall the characteristics of adjectives and the meaning of the erroneous adjectives. Understand and use words, terms and expressions from the Tamil language.
Paper XII Sem III	Kanini	Understand the importance of the Computer Application of communication network in information technology Explore the Teaching methods Develop individual skills in teaching and learning Develop communication skills
Viruppapadam Sem III	Periyariyal	Birth, education , marriage, rational attitude , stir fry, the battle of vaikom, public life, congress entry, congress left over the country, republic magazine start, self-directed movement, parppanarallatar conference , eradication – anti- hindi protest and jail, tamilnadu is for tamils, dravidian club origin, justice party leader, qpeople's movement, dravida munnetra kazhagam – tamil welfare struggles.
Viruppapadam Sem III	Oppilakkiyam	Gain an understanding about the various literatures of the world. Develop the skill of translation. Understand and analyse principles, style and narrative techniques of the different authors. Develop the skill in comparing and analysing World literature, General literature,National Literature etc.. Learn to evaluate the writings of Tamil poets in contrast with authors of other languages. To Compare The Other Language Litertature With Tamil Literature And Assist The Development Of Tamil Literature.
Paper XIII Sem IV	Sanga Ilakkiyam	To analyze Sangam literature Analyze the external principles that has shaped Sangam Literature Analyze the internal principles that has shaped Sangam Literature. Understand the classical language and its importance Know how to review the impact of Sangam Literature on Present day Tamil Literature. To make the student aware of the highs and lows of romantic biographical elements of the songs in eight and ten songs.
Paper XIV	Tholkappiyam Ezhuthu	Understand the Grammer used in Tholkappiyam Understand and practice the methods of writing

Sem IV		without errors. Learn to evaluate thealphabets . Learn to explore the origins of writing. Learn new meanings through the coinage of words.
Paper XV Sem IV	Tholkappiyam Soll	Learn to review the paper, Gender, Number, Location, Case, Question and answer. Learn the names of differentimages and its discriminations. Evaluate the grammer of the verbs, hypotheticalusage andits noun types. Recall the characteristics of adjectives and the meaning of the erroneous adjectives. Understand and use words, terms and expressions from the Tamil language.
Viruppapadam Sem IV	Mozhipeyarppiyal	Understand the creativity, lifestyle and the culture of other language authors. Develop the skill of creative writing – especially short stories. Learning and analyzing translated novels. Learning foreign dramas and applying them in their day-today life. Gain an understanding of Greek spirituality, culture and tradition.
Viruppapadam Sem IV	Oodagaviyal	Develop the skill of writing for communication media Understand the importance of communication Teach students how to use the internet Understand how to bring social change through communication. Gain awareness of social issues

Programme Outcomes (PO), Programme Specific Outcomes (PSO) and Course Outcomes(CO) at VESASC

M.Sc.ComputerScience

M.Sc.ComputerScience	1. The student gets familiar to various core technologies in IT industry such asprogramming, testing, operating system administration, networking, websitedesigning, databases etc 2. The syllabus also covers subjects to develop soft skills of students which enables them to prepare better resume, interviews, leadership skills, etc. 3. This enables the student to get absorbed in the campus placement. 4. The syllabus prepares the students to prepare for certification courses	
Class/ Paper/ Semester	Title	Course Outcome
FYMSC CS SEM I	Design and Analysis of Algorithms	Analyze the correctness of algorithms using inductive proofs and invariants. Analyze worst-case running times of algorithms using asymptotic analysis.
FYMSC CS SEM I	Advanced Java Programming	Students will be able to develop Java Standalone applications and EJB using JDBC servlets.Choose the appropriate data structure for modeling a given problem.
FYMSC CS SEM I	System Software	Students must be able to analyze and design the problem in system software
FYMSC CS SEM I	Practical – I: Advanced Java Programming Lab	Understand the numeric or real life application problems and solve them.Apply a solution clearly and accurately in a program using EJB using JDBC servlets
FYMSC CS SEM I	Practical – I: Operating Systems Lab	Understand the structure and functions of Operating System.Compare the performance of

		Scheduling Algorithms.Analyze resource management techniques
FYMSC CS SEM I	Theoretical Foundations of Computer Science	Fundamental concepts of Theoretical Foundations of Computer Science . Analyze and compute various operation and automata theory.
FYMSC CS SEM II	Computer Networks	Analyze different network models Describe, analyze and compare a number of data link, network and transport layer Analysing key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP
FYMSC CS SEM II	DISTRIBUTED DATABASE SYSTEM	Describe basic concepts of database system .Design a Data model and Schemas in DDBMS.Competent in use of SQL .Analyze functional dependencies for designing robust Database
FYMSC CS SEM II	Practical – III: RDBMS Lab	Design a Data model and Schemas in RDBMS.Competent in use of SQL.Analyze functional of data normalization.
FYMSC CS SEM II	Elective –I MULTIMEDIA SYSTEMS	Understand the basic concepts of multimedia systems and its application
FYMSC CS SEM II	Practical – III: Multimedia Systems Lab	Develop various multimedia software using Flash,Photoshop,Dream weaver softwares
FYMSC CS SEM II	Bio-Informatics	Analyze and introduces the basic and fundamental concepts of Bio-informatics
SYMSC CS SEM III	Principles of Compiler Design	Understand the process compiler and automata process by Compiler Analyze the memory management and its allocation policies. To evaluate the requirement for process synchronization.
SYMSC CS SEM III	Object Oriented Analysis and Design	Specify, analyze and design the use case driven requirements for a particular system. Identify, Analyze the

		subsystems, various components and collaborate them interchangeably.
SYMSC CS SEM III	Digital Image Processing	To describe what Digital Image Processing is, and fundamentals of image processing technique
SYMSC CS SEM III	Elective-II Artificial Intelligence	Gain a working knowledge of the foundations of and modern applications in, artificial intelligence heuristic search, knowledge representation and logic.
SYMSC CS SEM III	Elective-III Cryptography	Compare various Cryptographic Techniques Design Secure applications
SYMSC CS SEM III	Practical – V:Mini Project	The aim of the mini project is that the student has to understand the real time software development environment. The student should gain a thorough knowledge in the problem, he/she has selected and the language / software, he/she is using.
SYMSC CS SEM IV	Project & Viva-Voce	The aim of the project & viva-voce is that the student has to understand the real time software development environment. The project work is to be carried out either in a software industry or in an academic institution for the entire semester and the report of work done is to be submitted to the University

PROGRAMME OUTCOME AND PROGRAMME SPECIFIC OUTCOME

PROGRAMME : M.SC APPLIED MICROBIOLOGY

2. Programme Learning Outcome

Nature and Extent of the Programme

The postgraduate programme in Applied Microbiology is the master's level of college or university degree in the country as in several other parts of the world. After obtaining this degree, a microbiologist may enter into the job market or opt for undertaking further higher studies in the subject. After graduation the students may join industry, academia, and public health and play their role as microbiologists in a useful manner contributing their role in the development of the welfare society. Thus the undergraduate level degree in microbiology must prepare the students for all these objectives. Thus the LOCF curriculum developed has a very wide range covering all aspects of Microbiology with reasonable depth of knowledge and skills so to as to diversify them in various specialties of the subject and play their role professionally as expected of them. It is also imperative that microbiologists are evaluated in a manner appropriate to assess their proper development as microbiologists.

PROGRAMME SPECIFIC OUTCOME

Aim of the Programme

The aim of the postgraduate degree in Applied Microbiology is to make students knowledgeable about the various basic concepts in a wide ranging context which involve the use of knowledge and skills of Microbiology. Their understanding, knowledge and skills in Microbiology needs to be developed through a thorough teaching learning processes in the class, practical skills through the laboratory work, their presentation and articulation skills, exposure to industry and interaction with industry experts.

Graduate attributes

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. They should have the appropriate skills of Microbiology so as to perform their duties as microbiologists. They must be able to analyze the problems related to microbiology and come up with most suitable solutions. 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. 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. Several newer developments are taking place in microbiology. 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. They are also made aware of the requirements of developing a Microbiology enterprise by having knowledge of patents, copyrights and various regulatory processes to make their efforts a success.

Besides attaining the attributes related to the profession of Microbiology, the 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. 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.

COURSEWISE OUTCOME

Class/ Semester	Paper/	Title / Subject Name	Course Outcome
I M.SC **Semester - I**	Core Paper I	MDT1A-Microbial Taxonomy	**Learning Outcomes** 1. The academic discipline of defining groups of biological organisms on the basis of shared characteristics and giving names to those groups. 2. Each group is given a rank and groups of a given rank can be aggregated to form a super group of higher rank and thus create a hierarchical classification. **3. Bacteria** are **classified** and identified to distinguish one organism from another and to group similar organisms by criteria of interest to microbiologists or other scientists. 4.The most **important** level of this type of **classification** is the species level.
I M.SC **Semester - I**	Core Paper II	MDT1B-General Microbiology and Lab Animal Science	**Learning Outcomes:** 1. Understand the developments in Microbiology and list the contributions of various scientists. 2. Illustrate the structure and function of Microbial cells. Utilize the principles and applications of different types of Microscope. Apply various staining procedures for visualising microorganisms under the microscope. 3. Analyse the nutritional requirement of microorganisms and their cultivation techniques under laboratory conditions. Assess the implication of various sterilisation procedures and bio safety measures in clinical labs and industries. 4. Assess various metabolic pathways occurring in microorganisms and their significance. 5. Acquire knowledge about antibiotics and

			mode of action.
I M.SC **Semester - I**	Core Paper III	MDT1C-Immunology	1. demonstrate the basic knowledge of immunological processes at a cellular and molecular level 2. define central immunological principles and concepts • outline, compare and contrast the key mechanisms and cellular players of innate and adaptive immunity and how they relate 3. elucidate the genetic basis for immunological diversity and the generation of adaptive immune responses 4. outline key events and cellular players in antigen presentation, and how the nature of the antigen will shape resulting effector responses 5. identify the main mechanisms of inflammation • outline key events and cellular players governing mucosal immunity • 6. understand the principles governing vaccination and the mechanisms of protection against infectious diseases • 7. understand and explain the basis of immunological tolerance, autoimmunity and transplantation • 8. understand and explain the basis of allergy and allergic diseases. • 9. understand and explain the immune system in cancer; tumor immunology and principles of immunotherapy
I M.SC **Semester - I**	Elective – I	MDTAA-Metabolic Pathways	1. Metabolism is a central theme in biochemistry; it keeps cells and organisms alive, by giving them the energy they need to carry on and the building blocks they require for growth and propagation. 2. Metabolism is also an important theme in medicine and pharmacy. 3. Be able to describe the various modes of regulation of metabolic pathways as they are presented in this lecture. 4. Be able to explain the key properties of coenzymes, and know the types of group carried by each coenzyme discussed in this lecture. 5. Be able to explain what isozymes are and

			why they are important in medicine. 6. Be able to describe the important characteristics of anabolic pathways and catabolic pathways.
I M.SC **Semester - I**	Elective – II	MDTAB – Microbial Diversity	1. Describe common groups of bacteria and archaea in different ecosystems, and their role in biogeochemical key processes in these environments. 2. Describe for cultivation-independent methods for studies of the composition of microbial communities and for the function and occurrence of individual groups. 3.Describe genomic-based methods to study microbial diversity in nature and for the mechanisms behind it. 4. Describe important interactions within microbial communities and between microorganisms and plants and animals. 5. Evaluate, synthesise and present scientific studies of genetic and functional microbial diversity in different ecosystems. 6. To use bioinformatic tools and databases that are used to study microbial diversity.
I M.SC **Semester - I**	Core Practical –I-Major Practical-I	MDT11-General Microbiology And Microbial Physiology and Immunology Practicals	Learning outcomes: 1. Learn the concept of sterilization processes and apply them in sterilization of different media. 2. Acquire skills to isolate an organism using different technique and to Know various Culture media and their applications. 3. Attain the practical skills in microscopy and their handling techniques and staining procedures. 4. To evaluate antibiotic sensitivity pattern using different methods. 5. Identification of pathogens by standard techniques and methods of culturing preservation and maintenance of microorganisms

			6. Demonstrate detailed knowledge and understanding of immunology and the way it is applied in diagnostic and therapeutic techniques and research; 7. Demonstrate knowledge and practical skills in undertaking simple immunological experiments that mimic those undertaken in diagnostic laboratories and research laboratories; 8. Articulate and adhere to safe working practice in a mixed microbiology/immunology laboratory.
I M.SC **Semester - II**	Core Paper IV	MDT2A-Medical Virology	Learning outcomes: 1. Knowledge about viruses and the chemical nature of viruses, different types of viruses infecting animals, plants and bacteria - Bacteriophages 2. Understanding about the emerging viral diseases. 3. Information about the role of viruses in the causation of the cancer. 4. Gain wider knowledge on clinical aspects and related implications of viral diseases. 5. Knowledge on viral vaccines and antiviral drugs.
I M.SC **Semester - II**	Core Paper V	MDT2B-Systematic Medical Bacteriology	**Learning outcomes:** 1. Knowledge of various techniques of sample collection, transport and processing for laboratory diagnosis of bacterial diseases. 2.Knowledge of basic and general concepts of causation of disease by the pathogenic microorganisms. 3.Information for the assessment of their severity including the broad categorization of the methods of diagnosis. 4.Insights to practical aspects of antibiotic

			sensitivity testing. 5.Knowledge of various zoonotic infections, ways to tackle them and use biosafety precautions.
I M.SC **Semester - II**	Core Paper VI	MDT2C- Mycology and Parasitology	**Learning outcomes**: 6. Information for collection of different clinical samples, their transport, culture and examination by microscopy, staining and biochemical methods for the diagnosis of fungal and protozoan diseases. 7. Knowledge of basic and general concepts of causation of disease by the pathogenic microorganisms and the various parameters of assessment of their severity including the broad categorization of the methods of diagnosis. 8. Insights to treatment options of fungal and protozoan diseases. 9. Knowledge about the importance of protozoan in the intestine. 10. Knowledge of Nematodes as infectious agent.
I M.SC **Semester - II**	Core Paper VII	MDTAC- Industrial and Pharmaceutical Microbiology	Learning outcome: 1. Understand the basic knowledge about the fermentation process and the requirements of process. 2. Gain the basic knowledge about the designing of fermentation 3. Acquire the knowledge about the production of antibiotic and enzymes 4. Equip themselves about knowledge of the various separation procedures in pharmaceutical industries 5. Understand about the principles of raw material used in pharmaceuticals and validation and sterility of pharmaceutical product

I M.SC **Semester - II**	Elective – III	MDTBA-Bioinformatics and Biostatistics	
I M.SC **Semester - II**	Core Practical – II- Major Practical-II	MDT21-Systematic Medical Bacteriology, Mycology, Parasitology and Virology Practicals	Learning outcomes: 1.Skills to identify medically important bacteria, fungus and parasites from the clinical samples. 2.Very good information about practical aspects of collection of different clinical samples, their transport, culture and examination by staining, and biochemical tests for diagnosis of bacterial diseases. 3.In depth knowledge on clinical sample processing. 4.Knowledge to promote diagnostic skills, including the use and interpretation of laboratory tests in the diagnosis of infectious diseases. 5.Insights to antibiotic sensitivity determination
II M.SC **Semester - III**	Core Paper VIII	MDT3A-Microbial Genetics	
II M.SC **Semester - III**	Core Paper IX	MDT3B-Genetic Engineering	Learning outcomes: 1. Acquire knowledge about the History and the development of biotechnology and genetic engineering with the contribution of the scientist 2. Equipped with various production methods of the widely used biotechnological products 3. Gain basic understanding of role of the enzymes as a tool in Biotechnology 4. Learn the significance of Vector, as a tool in the construction of genetic modification of the organisms. 5. Be familiarize with understanding of use of biotechnology and genetic engineering in health,agriculture and industries.
II M.SC **Semester - III**	Core Paper X	MDT3C-Molecular Biology	**Learning Outcomes:** **1.** Understand the chemical components of DNA and various forms of DNA. Know about the organization of prokaryotic and eukaryotic genome.

			2. Understand the DNA replication, repair and recombination in prokaryotes with that of eukaryotes. 3. To know about RNA synthesis and processing and function of different types of RNA. 4. To know about protein synthesis and inhibition factors of protein synthesis. 5. To Understand prokaryotic and eukaryotic gene expression and control of gene expression
II M.SC **Semester - III**	Elective – IV	MDTAD- Soil and Agricultural Microbiology	
II M.SC **Semester - III**	Elective – V	MDTBB- Environmental Biotechnology	Learning outcomes: 1. Acquire knowledge about the History and the development of biotechnology and genetic engineering with the contribution of the scientist 2. Equipped with various production methods of the widely used biotechnological products 3. Gain basic understanding of role of the enzymes as a tool in Biotechnology 4. Learn the significance of Vector, as a tool in the construction of genetic modification of the organisms. 5. Be familiarize with understanding of use of biotechnology and genetic engineering in health,agriculture and industries.
II M.SC **Semester - III**	Core Practical – III- Major Practical-III	MDT31- Microbial Genetics, Genetic Engineering and Molecular Biology Practicals	Learn to estimate DNA and RNA. 2. Learn to isolate Plasmid, Genomic and Chromosomal DNA. 3. Learn to isolate RNA and antibiotic resistant mutants.

			4. Acquire Knowledge in Preparation of competent cells. 5. Acquire Knowledge in Transformation of E. coli
II M.SC **Semester - IV**	Core Paper XI	MDT4A- Food,Dairy and Environmental Microbiology	. Learning outcome: 1. Gain knowledge about food as a substrate for various microbes, the role of factors and its importance 2. Understand about the principles and application of different types of food preservation technique, chemical preservative and its advantages and disadvantages 3. Equip themselves the pragmatic understanding of food spoilage 4. Acquire a thorough understanding of food borne diseases, testing methods, and preventive technique. 5. Learn about the various fermented product and its various stage spoilage
II M.SC **Semester - IV**	Elective - VI	MDTAE- Research Methodology	
II M.SC **Semester - IV**	Core Practical – IV- Major Practical-IV	MDT4A- Applied Microbiology Practicals	Learning outcome: 1. To learn about Detection of number of Bacteria in milk by various method. 2. Gains knowledge to determine the quality of milk. 3. Learn to isolate the yeast and molds from spoiled nuts, fruits, and vegetables and also to examine specific food for bacterial contamination.

			4. Knowledge gain to determine of BOD and COD of wastewater and Water analysis by MPN and Membrane filter method. 5. Learn to Quantify the microorganisms in air settle plate and air sampler methods. Detection of aflatoxin B1 from moldy grains using thin layer chromatography.
II M.SC **Semester - IV**	Dissertation	MDT4Q-Project & Viva voce	
III B.SC **Semester - V**	Elective-I	TEN5A-Biotechnology and Genetic Engineering	Learning outcomes: 1. Acquire knowledge about the History and the development of biotechnology and genetic engineering with the contribution of the scientist 2. Equipped with various production methods of the widely used biotechnological products 3. Gain basic understanding of role of the enzymes as a tool in Biotechnology 4. Learn the significance of Vector, as a tool in the construction of genetic modification of the organisms. 5. Be familiarize with understanding of use of biotechnology and genetic engineering in health,agriculture and industries.
III B.SC **Semester - VI**	Core Paper XIII	TAN6A-Environmental Microbiology	Learning outcome : 1. The basic knowledge about the natural ecosystem and role of microorganisms in the eco system. 2. An understanding of the composition of air, air borne organisms and how the organisms causes the diseases and its preventive measures 3. Knowledge about different types of microorganism in water causes of water pollution, and methods to analyze the quality of water and treatment for purification of drinking water, hygienic practices to control

			the water borne diseases. 4. An understanding the role and application of microorganisms to degrade the environmental contaminants. and microbes involved in solid and liquid waste management. 5. Knowledge about the role of microbes in biodegradation and bioremediation of heavy metals and hydrocarbon etc.
III B.SC **Semester - VI**	Core Paper XIV	TAN6B-Food and Dairy Microbiology	Learning outcome: 1. Gain knowledge about food as a substrate for various microbes, the role of factors and its importance 2. Understand about the principles and application of different types of food preservation technique, chemical preservative and its advantages and disadvantages 3. Equip themselves the pragmatic understanding of food spoilage 4. Acquire a thorough understanding of food borne diseases, testing methods, and preventive technique. 5. Learn about the various fermented product and its various stage spoilage
III B.SC **Semester - VI**	Core Paper XV Major Practical VI	TAN62-Environmental, Food and Dairy Microbiology	Learning outcome: 1. To learn about Detection of number of Bacteria in milk by various method. 2. Gains knowledge to determine the quality of milk. 3. Learn to isolate the yeast and molds from spoiled nuts, fruits, and vegetables and also to examine specific food for bacterial contamination. 4. Knowledge gain to determine of BOD and COD of wastewater and Water analysis by MPN and Membrane filter method. 5. Learn to Quantify the microorganisms in air settle plate and air sampler methods. Detection

			of aflatoxin B1 from moldy grains using thin layer chromatography.