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**MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE COLLEGE**  
 MUKKAM, MANASSERY P.O, KOZHIKODE – 673602

(Affiliated to the University of Calicut Re-accredited by NAAC with ‘A’ Grade)  
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**PO PSO CO 2018-19**

**B Sc. PHYSICS**

<b>Programme outcome</b>	Programme offers theoretical as well as practical knowledge about different subject areas. It helps to develop scientific temper and thus can prove to be more beneficial for the society as the scientific developments can make a nation or society to grow at a rapid pace. After the completion of this course students have the option to go for higher studies i.e. M. Sc and then do some research for the welfare of mankind
<b>Programme Specific Outcomes</b>	Understand the basic concepts of methodology of science and the fundamentals of mechanics, properties of matter and electrodynamics, Understand the theoretical basis of quantum mechanics, relativistic physics, nuclear physics, optics, spectroscopy, solid state physics, astrophysics, statistical physics, photonics and thermodynamics, Understand and apply the concepts of electronics in the designing of different analog and digital circuits, Apply and verify theoretical concepts through laboratory experiments
<b>Courses</b>	<b>Outcomes</b>
Core course I - Methodology of Science and Physics	Understand the features, methods and limitations of science, Understand and apply the fundamentals of vector calculus and matrices
Core course II- Properties of matter and waves acoustics	Understand and apply the fundamentals of vector calculus, Understand the basics. ideas of harmonic oscillations, Understand and analyze the basics concepts of wave motion and basic theory of acoustics

Core Course II - Mechanics	Understand the features of non-inertial systems and fictitious forces, Understand and analyze the features of central forces with respect to planetary motion Understand and apply the basic concepts of Newtonian Mechanics to physical systems, Understand and apply the basic idea of work-energy theorem to physical systems, understand and analyze the basic theory of lagrangian formulation, Understand the basic concept of special theory of relativity.
Core Course III – Electrostatics-I	Understand and analyze the electrostatic properties of physical systems, Understand the mechanism of electric field in matter, Understand and analyze the magnetic properties of physical systems, Understand the mechanism of magnetic field in matter.
Core Course IV - Electrostatics II	Understand the basic concepts of electrostatics, Understand and analyze the properties of electromagnetic waves, Understand the behavior of transient currents, Understand the basic aspects of ac circuits, Understand and apply electrical network theorems.
Core Course VII - Quantum Mechanics	Understand the particle properties of electromagnetic radiation, Describe Rutherford – Bohr model of the atom, Understand the wavelike properties of particles, Understand and apply the Schrödinger equation to simple physical systems, Apply the principles of wave mechanics to the Hydrogen atom.
Core Course VIII - Optics	Understand the fundamentals of Fermat's principles and geometrical optics, Understand and apply the basic ideas of interference of light, Understand and apply the basic ideas of diffraction of light, Understand the basics ideas of polarization of light, Describe the basic principles of holography and fiber optics.
Core Course IX- Electronics (Analog and Digital)	Understand the basic principles of rectifiers and dc power supplies, Understand the principles of transistor, Understand the working and designing of transistor amplifiers and oscillators, Understand the basic operation of Op – Amp and its applications, Understand the basics of digital electronics.
Core Course X – Thermal & Statistical Physics	Understand the zero and first laws of thermodynamics, Understand the thermodynamics description of the ideal gas, Understand the second law of thermodynamics and its applications, Understand the basic ideas of entropy, Understand the concepts of thermodynamic potentials and phase transitions. Understand the basic principles of statistical physics and its application
Core Course XI - Solid State	Understand the basic aspects of crystallography in solid

Physics, Spectroscopy and Photonics	state physics, Understand the basic elements of spectroscopy, Understand the basics ideas of microwave and infra red spectroscopy, Understand the fundamental ideas of photonics.
Core Course XII - Nuclear Physics and Particle Physics	Understand the basic aspects of nuclear structure and fundamentals of radioactivity, Describe the different types of nuclear reactions and their applications, Understand the principle and working of particle detectors, Describe the principle and working of particle accelerators, Understand the basic principles of elementary particle physics.
Core Course XIV (Elective:EL1 / EL2 / EL3) PHY6B14 (EL2): NANOSCIENCE AND TECHNOLOGY	Understand the elementary concepts of Nanoscience, Understand the electrical transport mechanisms in nanostructures, Understand the applications of quantum mechanics in Nanoscience, Understand the fabrication and characterization techniques of Nanomaterials, Enumerate the different applications of nanotechnology.
Core Course V - Practical I	Apply and illustrate the concepts of properties of matter through experiments, Apply and illustrate the concepts of electricity and magnetism through experiments, Apply and illustrate the concepts of optics through experiments, Apply and illustrate the principles of electronics through experiments.
Core Course Practical XV – Practical II	Apply and illustrate the concepts of properties of matter through experiments, Apply and illustrate the concepts of electricity and magnetism through experiments, Apply and illustrate the concepts of optics and spectroscopy through experiments, Apply and illustrate the principles of heat through experiments.
Core Course Practical XVI – Practical III	Apply and illustrate the principles of semiconductor diode and transistor through experiments, Apply and illustrate the principles of transistor amplifier and oscillator through experiments, Apply and illustrate the principles of digital electronics through experiments, Analyze and apply computational techniques in Python programming.
Core Course XVII Project/Research methodology	Understand research methodology, Understand and formulate a research project, Design and implement a research project, Identify and enumerate the scope and limitations of a research project.

**BSc POLYMER CHEMISTRY 2018-19**

<b>PROGRAMME OUTCOME</b>	This curriculum has been prepared with the objective of giving sound knowledge and understanding of chemistry to undergraduate students. The goal of the syllabus is to make the study of chemistry stimulating, relevant and interesting. It has been prepared with a view to equip students with the potential to contribute to academic and industrial environments. This curriculum will expose students to various fields in chemistry and develop interest in related disciplines. Chemistry, being a border science to biology, physics and engineering, has a key role to play in the understanding of these disciplines. The updated syllabus is based on an Interdisciplinary approach to understand the application of the subject in daily life.
<b>PROGRAMME SPECIFIC OUTCOME</b>	<p>To understand basic facts and concepts in chemistry.</p> <p>To apply the principles of chemistry..</p> <p>To appreciate the achievements in chemistry and to know the role of chemistry in nature and in society.</p> <p>To familiarize with the emerging areas of chemistry and their applications in various spheres of chemical sciences and to apprise the students of its relevance in future studies.</p> <p>To develop skills in the proper handling of instruments and chemicals.</p> <p>To familiarize with the different processes used in industries and their applications.</p> <p>To develop an eco-friendly attitude by creating a sense of environmental awareness.</p> <p>To be conversant with the applications of chemistry in day-to-day life.</p>
<b>COURSES</b>	<b>OUTCOMES</b>
<b>CHE1B01 Theoretical and Inorganic Chemistry- I</b>	<p>To apply the methods of a research project.</p> <p>To understand the principles behind volumetry.</p> <p>To analyse the characteristics of different elements.</p> <p>To distinguish between different acid base concepts.</p> <p>To analyse the stability of different nuclei.</p>
<b>CHE2B02 Theoretical and Inorganic Chemistry- II</b>	<p>To understand the importance and the impact of quantum revolution in science.</p> <p>To understand and apply the concept that the wave</p>

	<p>functions of hydrogen atom are nothing but atomic orbitals.</p> <p>To understand that chemical bonding is the mixing of wave functions of the two combining atoms.</p> <p>To understand the concept of hybridization as linear combination of orbitals of the same atom.</p> <p>To inculcate an atomic/molecular level philosophy in the mind.</p>
<b>CHE3B03- PHYSICAL CHEMISTRY - I</b>	<p>To understand the properties of gaseous state and how it links to thermodynamic systems</p> <p>To understand the concepts of thermodynamics and its relation to statistical thermodynamics</p> <p>To apply symmetry operations to categorize different molecules</p>
<b>CHE4B04: ORGANIC CHEMISTRY – I</b>	<p>To apply the concept of stereochemistry to different compounds</p> <p>To understand the basic concepts of reaction mechanism</p> <p>To analyse the mechanism of a chemical reaction</p> <p>To analyse the stability of different aromatic systems</p>
<b>CHE4B05 (P): INORGANIC CHEMISTRY PRACTICAL – I</b>	<p>To enable the students to develop skills in quantitative analysis and preparing inorganic complexes.</p> <p>To understand the principles behind quantitative analysis</p> <p>To apply appropriate techniques of volumetric quantitative analysis in estimations</p> <p>To analyze the strength of different solutions</p>
<b>CHE5B06: INORGANIC CHEMISTRY – III</b>	<p>To understand the principles behind quantitative and qualitative analysis</p> <p>To understand basic processes of metallurgy and to analyse the merit of different alloys</p> <p>To understand the applications of different inorganic polymers</p> <p>To analyse different polluting agents</p> <p>To apply the principles of solid waste management</p>
<b>CHE5B07: ORGANIC CHEMISTRY – II</b>	<p>To understand the difference between alcohols and phenols</p> <p>To understand the importance of ethers and epoxides</p> <p>To apply organometallic compounds in preparation of different functional groups</p> <p>To apply different reagents for the inter conversion of aldehydes, carboxylic acids and acid derivatives</p> <p>To apply active methylene compounds in organic preparations</p>
<b>CHE5B08: PHYSICAL</b>	<p>To apply the concept of kinetics, catalysis and</p>

<b>CHEMISTRY – II</b>	photochemistry to various chemical and physical processes
	To characterize different molecules using spectral methods
	To understand various phase transitions and its applications
<b>CHE6B09: INORGANIC CHEMISTRY – IV</b>	To understand the principles behind different instrumental methods
	To distinguish between lanthanides and actinides
	To appreciate the importance of CFT
	To understand the importance of metals in living systems
	To distinguish geometries of coordination compounds
<b>CHE6B10: ORGANIC CHEMISTRY – III</b>	To elucidate structure of simple organic compounds using spectral techniques
	To understand the basic structure and tests for carbohydrates
	To understand the basic components and importance of DNA
	To understand the basic structure and applications of alkaloids and terpenes
	To distinguish different pericyclic reactions
<b>CHE6B11: PHYSICAL CHEMISTRY – III</b>	To get a thorough knowledge of electrochemistry, colligative properties and solid state
	To understand the basic concepts of electrochemistry
	To realize the importance of colligative properties
	To relate the properties of material/solids to the geometrical properties and chemical compositions
<b>CHE6B13(E2)</b>	To gain detailed knowledge about classification of polymers and various mechanisms and technology adopted for polymerization. To give a basic understanding of properties of polymers like glass transition temperature, molecular weight and degradation of polymers. To give detailed idea about different commercial polymers.
<b>POLYMER CHEMISTRY</b>	To understand various classification of polymers and types of polymerization methods.
	To understand the important characteristics of polymers such as average molecular weight, glass transition temperature, viscoelasticity and Degradation
	To appreciate the importance of processing techniques
	To differentiate commercial polymers and to understand the significance of recycling
<b>CHE6B14(P): PHYSICAL CHEMISTRY</b>	The relation between physical properties and chemical composition is used for analysis.

<b>PRACTICAL</b>	Get an idea of designing experimental methods to analyze the physical properties of molecules or materials.
	To enable the students to develop analytical skills in determining the physical properties (Physical constants)
	To develop skill in setting up a experimental methods to determine the physical properties
	To understand the principles of Refractometry, Potentiometry and Conductometry
<b>CHE6B15(P): ORGANIC CHEMISTRY PRACTICAL</b>	Empower the student to prepare different compounds without compromising yield. Characterisation and analysis of different organic compounds based on functional groups. Develop skill in separation and purification of mixtures.
	To enable the students to develop analytical skills in organic qualitative analysis
	To develop talent in organic preparations to ensure maximum yield
	To apply the concept of melting or boiling points to check the purity of compounds
	To analyze and characterize simple organic functional groups
	To analyse individual amino acids from a mixture using paper chromatography
<b>CHE6B16 (P): INORGANIC CHEMISTRY PRACTICAL-II</b>	To develop skill in quantitative analysis using gravimetric and colorimetric methods.
	To enable the students to develop analytical skills in inorganic quantitative analysis
	To understand the principles behind gravimetry and to apply it in quantitative analysis.
	To understand the principles behind colorimetry and to apply it in quantitative analysis.
<b>CHE6B17(P): INORGANIC CHEMISTRY PRACTICAL-III</b>	To develop skill in quantitative analysis of inorganic compounds
	To enable the students to develop skills in inorganic quantitative analysis.
	To understand the principles behind inorganic mixture analysis and to apply it in quantitative analysis.
	To analyse systematically mixtures containing two cations and two anions.
<b>CHE6B18(Pr): PROJECT WORK</b>	To develop skill in scientific research, critical thinking and reasoning.
	To understand the scientific methods of research project.
	To apply the scientific method in life situations.
	To analyse scientific problems systematically.

## BSc Mathematics

SEM I enables one to think systematically, to express ideas in precise and concise mathematical terms and also to make valid arguments. How to use logic to arrive at the correct conclusion in the midst of confusing and contradictory statements is also illustrated.

Successful completion of the course enables students to

- Prove results involving divisibility, greatest common divisor, least common multiple and a few applications.
- Understand the theory and method of solutions of LDE.
- Understand the theory of congruence and a few applications.
- Solve linear congruent equations.
- Learn three classical theorems viz. Wilson's theorem, Fermat's little theorem and Euler's theorem and a few important consequences.

SEM II The objective of the course is to introduce students to the fundamental ideas of limit, continuity and differentiability and also to some basic theorems of differential calculus. It is also shown how these ideas can be applied in the problem of sketching of curves and in the solution of some optimization problems of interest in real life. Application of integration is familiarized. The notion of definite integral not only solves the area problem but is useful in finding out the arc length of a plane curve, volume and surface areas of solids and so on

SEM III This enables to study a related notion of convergence of a series, which is practically done by applying several different tests such as integral test, comparison test and so on. This enables them to directly calculate the arc length and surface areas of revolution of a curve whose equation is in polar form. At the end of the course, the students will be able to handle vectors in dealing with the problems involving geometry of lines, curves, planes and surfaces in space and have acquired the ability to sketch curves in plane and space given in vector valued form.

SEM IV This enables the student to understand the relationship among the solutions of a given system of linear equations and some important subspaces associated with the coefficient matrix of the system. the course gives the students an opportunity to learn the fundamentals of linear algebra by capturing the ideas geometrically, by justifying them algebraically and by preparing them to apply it in several different fields such as data communication, computer graphics, modelling etc.

SEMV- MT5B05 One can observe the connection emerging between classical algebra and modern algebra. The last three modules are therefore devoted to the discussion on basic ideas and results of abstract algebra



MT5B06 The aim is to provide students with a level of mathematical sophistication that will prepare them for further work in mathematical analysis and other fields of knowledge, and also to develop their ability to analyse and prove statements of mathematics using logical arguments. to learn and deduce rigorously many properties of real number system. the learning will help them to appreciate the beauty of logical arguments and embolden them to apply it in similar and unknown problems. it helps in the calculation of square root of positive numbers and how it establishes the existence of the transcendental number  $e$  (Euler constant). to understand some basic topological properties of real number system. to get a rigorous introduction to algebraic, geometric and topological structures of complex number system, functions of complex variable, their limit and continuity and so on

SEM5 B07 The goal of numerical analysis is to provide techniques and algorithms to find approximate numerical solution to problems in several areas of mathematics where it is impossible or hard to find the actual/closed form solution by analytical methods and also to make an error analysis to ascertain the accuracy of the approximate solution. Understand several methods to find out the approximate numerical solutions of algebraic and transcendental equations with desired accuracy. Find out numerical approximations to solutions of initial value problems and also to understand the efficiency of various methods.

**SEM5 MT5B08** solve linear programming problems geometrically · understand the drawbacks of geometric methods · solve LP problems more effectively using Simplex algorithm via. the use of condensed tableau of A.W. Tucker · convert certain related problems, not directly solvable by simplex method, into a form that can be attacked by simplex method. · understand duality theory, a theory that establishes relationships between linear programming problems of maximization and minimization · understand game theory · solve transportation and assignment problems by algorithms that take advantage of the simpler nature of these problems

**SEM5-MT5B09** Understand several basic facts about parabola, hyperbola and ellipse (conics) such as their equation in standard form, focal length properties, and reflection properties, their tangents and normal. · Recognise and classify conics. · Understand Kleinian view of Euclidean geometry. · Understand affine transformations, the inherent group structure, the idea of parallel projections and the basic properties of parallel projections. · Understand the fundamental theorem of affine geometry, its use in the proof of Median theorem, Ceva's theorem, Menelaus' theorem etc. · Understand which conics are affine-congruent to each other · Realise the basic difference in identifying two geometric objects in Euclidean and affine geometries. · Understand Kleinian view of projective geometry · Understand the idea of homogeneous coordinate of a point in projective plane and write down the equation of a line in projective plane passing through two homogeneous coordinate · Know collinearity property and incidence property in projective plane. · Check whether a transformation is indeed projective and also to find the composite and inverse of projective transformations. · Identify some projective properties · Write down the projective transformation that maps a given set of four points to another set of four points. · Appreciate the advantage of interpreting a Euclidean theorem as a projective theorem by learning a simpler proof for Desargues and Pappu's theorem. ·

Understand the concept of cross ratio and calculate it · Find an application of cross ratio in the context of aerial photography.

- SEM6B10** State the definition of continuous functions, formulate sequential criteria for continuity and prove or disprove continuity of functions using this criteria.
- Understand several deep and fundamental results of continuous functions on intervals such as boundedness theorem, maximum-minimum theorem, intermediate value theorem, preservation of interval theorem and so on.
  - Realise the difference between continuity and uniform continuity and equivalence of these ideas for functions on closed and bounded interval.
  - Understand the significance of uniform continuity in continuous extension theorem.
  - Develop the notion of Riemann integrability of a function using the idea of tagged partitions and calculate the integral value of some simple functions using the definition.
  - Understand a few basic and fundamental results of integration theory.
  - Formulate Cauchy criteria for integrability and a few applications of it. In particular they learn to use Cauchy criteria in proving the non integrability of certain functions.
    - Understand classes of functions that are always integrable
  - Understand two forms of fundamental theorem of calculus and their significance in the practical problem of evaluation of an integral.
  - Find a justification for ‘change of variable formula’ used in the practical problem of evaluation of an integral.
    - Prove convergence and divergence of sequences of functions and series
  - Understand the difference between pointwise and uniform convergence of sequences and series of functions
    - Answer a few questions related to interchange of limits.
  - Learn and find out examples/counter examples to prove or disprove the validity of several mathematical statements that arise naturally in the process/context of learning.
    - Understand the notion of improper integrals, their convergence, principal value and evaluation.
  - Learn the properties of and relationship among two important improper integrals namely beta and gamma functions that frequently appear in mathematics, statistics, science and

**SEM6B11** to understand the difference between differentiability and analyticity of a complex function and construct examples. · to understand necessary and sufficient condition for checking analyticity. · to know of harmonic functions and their connection with analytic functions · to know a few elementary analytic functions of complex analysis and their properties. · to understand definition of complex integral, its properties and evaluation. · to know a few fundamental results on contour integration theory such as Cauchy’s theorem, Cauchy-Goursat theorem and their applications. · to understand and apply Cauchy’s integral formula and a few consequences of it such as Liouville’s theorem, Morera’s theorem and so forth in various situations. · to see the application of Cauchy’s integral formula in the derivation of power series expansion of an analytic function. · to know a more general type of series expansion analogous to power series expansion viz.

Laurent's series expansion for functions having singularity. · to understand how Laurent's series expansion lead to the concept of residue, which in turn provide another fruitful way to evaluate complex integrals and, in some cases, even real integrals. · to see another application of residue theory in locating the region of zeros of an analytic function

**SEM 6 MT6B12** Understand several contexts of appearance of multivariable functions and their representation using graph and contour diagrams. · Formulate and work on the idea of limit and continuity for functions of several variables. · Understand the notion of partial derivative, their computation and interpretation. · Understand chain rule for calculating partial derivatives. · Get the idea of directional derivative, its evaluation, interpretation, and relationship with partial derivatives. · Understand the concept of gradient, a few of its properties, application and interpretation. · Understand the use of partial derivatives in getting information of tangent plane and normal line. · Calculate the maximum and minimum values of a multivariable function using second derivative test and Lagrange multiplier method. · Find a few real life applications of Lagrange multiplier method in optimization problems. · Extend the notion of integral of a function of single variable to integral of functions of two and three variables. · Address the practical problem of evaluation of double and triple integral using Fubini's theorem and change of variable formula. · Realise the advantage of choosing other coordinate systems such as polar, spherical, cylindrical etc. in the evaluation of double and triple integrals. · See a few applications of double and triple integral in the problem of finding out surface area, mass of lamina, volume, centre of mass and so on. · Understand the notion of a vector field, the idea of curl and divergence of a vector field, their evaluation and interpretation. · Understand the idea of line integral and surface integral and their evaluations. · Learn three major results viz. Green's theorem, Gauss's theorem and Stokes' theorem of multivariable calculus and their use in several areas and directions.

**SEM 6- MT6B13** Students could identify a number of areas where the modelling process results in a differential equation. · They will learn what an ODE is, what it means by its solution, how to classify DEs, what it means by an IVP and so on. · They will learn to solve DEs that are in linear, separable and in exact forms and also to analyse the solution. · They will realise the basic differences between linear and non linear DEs and also basic results that guarantees a solution in each case. · They will learn a method to approximate the solution successively of a first order IVP. · They will become familiar with the theory and method of solving a second order linear homogeneous and nonhomogeneous equation with constant coefficients. · They will learn to find out a series solution for homogeneous equations with variable coefficients near ordinary points. · Students acquire the knowledge of solving a differential equation using Laplace method which is especially suitable to deal with problems arising in engineering field. · Students learn the technique of solving partial differential equations using the method of separation of variables.

## B Sc Computer Science

<b>PO</b>	<p>The basic objective of the Programme is to open a channel of admission for computing courses for students, who have done the 10+2 and are interested in taking computing/IT as a career. After acquiring the Bachelor's Degree (B.Sc. Computer Science) at University of Calicut, there is further educational opportunity to go for MCA or other Master's Programme like M.Sc.(Computer Science), MSc (IT), MBA, etc., at this university or at any other University/Institute. Also after completing the B.Sc. Computer Science Programme, a student should be able to get entry level job in the field of Information Technology or ITES or they can take up self-employment in Indian &amp; global software market.</p> <p>The specific objectives of the Programme include</p> <ol style="list-style-type: none"> <li>1. To attract young minds to the potentially rich &amp; employable field of computer applications</li> <li>2. To be a foundation graduate Programme this will act as a feeder course for higher studies in the area of Computer Science/Applications</li> <li>3. To develop skills in software development so as to enable the B.Sc. Computer Science graduates to take up self-employment in Indian &amp; global software market.</li> <li>4. To train &amp; equip the students to meet the requirements</li> </ol>
<b>PSO</b>	<ol style="list-style-type: none"> <li>1. Students will be able to complete successfully be able to program small-to-mid-size programs on their own. Sufficient programming skills will require use of good practice</li> <li>2. Students will be able to use appropriately system design notations and apply system design engineering process in order to design, plan, and implement software systems</li> <li>3. Students will be prepared for a career in an information technology oriented business or industry, or for graduate study in computer science or other scientific or technical fields</li> </ol>
<b>CO</b>	
<p>Core course I - BCS1B01 – COMPUTER FUNDAMENTALS</p>	<ul style="list-style-type: none"> <li>• To equip the students with fundamentals of Computer</li> <li>• To learn the basics of Computer organization</li> <li>• To equip the students to write algorithm and draw flow chart for solving simple problems</li> </ul>

AND HTML	<ul style="list-style-type: none"> <li>• To learn the basics of Internet and webpage design</li> </ul>
Core course II- BCS2B02 – PROBLEM SOLVING USING C	<ul style="list-style-type: none"> <li>• To equip the students with fundamental principles of Problem Solving aspects.</li> <li>• To learn the concept of programming</li> <li>• To study C language</li> <li>• To equip the students to write programs for solving simple computing problems</li> </ul>
Core Course III – BCS2B03 - Programming Laboratory I: HTML and Programming in C	<ul style="list-style-type: none"> <li>• To make the students learn web designing</li> <li>• To make the students learn programming environments.</li> <li>• To practice procedural programming concepts.</li> <li>• To make the students equipped to solve mathematical or scientific problems using C</li> </ul>
Core Course IV - BCS3B04 – Data Structures Using C	<ul style="list-style-type: none"> <li>• To introduce the concept of data structures</li> <li>• To make the students aware of various data structures</li> <li>• To equip the students implement fundamental data structures</li> </ul>
Core Course V - BCS4B05 – Database Management System and RDBMS	<ul style="list-style-type: none"> <li>• To learn the basic principles of database and database design</li> <li>• To learn the basics of RDBMS</li> <li>• To learn the concepts of database manipulation SQL</li> <li>• To study PL/SQL language</li> </ul>
Core Course VI - BCS4B06 Programming Laboratory II: Data Structures and RDBMS	<ul style="list-style-type: none"> <li>• To make the students equipped to solve mathematical or scientific problems using C</li> <li>• To learn how to implement various data structures.</li> <li>• To provide opportunity to students to use data structures to solve real life problems.</li> <li>• To learn how to manage and process databases using PL/SQL language</li> </ul>
Core Course VII- BCS5B07 Computer Organization and Architecture	<ul style="list-style-type: none"> <li>• To learn logic gates, combinational circuits and sequential circuits</li> <li>• To learn basics of computer organization and architecture</li> </ul>
Core Course VIII – BCS5B08 Java Programming	<ul style="list-style-type: none"> <li>• To review on concept of OOP.</li> <li>• To learn Java Programming Environments.</li> <li>• To practice programming in Java.</li> <li>• To learn GUI Application development in JAVA</li> </ul>
Core Course IX - BCS5B09 Web	<ul style="list-style-type: none"> <li>• To learn web Programming Environments.</li> </ul>

Programming Using PHP	<ul style="list-style-type: none"> <li>• To practice web programming in PHP.</li> </ul>
Core Course X - BCS5B10 Principles of Software Engineering	<ul style="list-style-type: none"> <li>• To learn engineering practices in Software development.</li> <li>• To learn various software development methodologies and practices.</li> <li>• To learn and study various Evaluation methods in Software Development</li> </ul>
Core Course XI BCS6B11 Android Programming	<ul style="list-style-type: none"> <li>• To have a review on concept of Android programming.</li> <li>• To learn Android Programming Environments.</li> <li>• To practice programming in Android.</li> <li>• To learn GUI Application development in Android platform with XML</li> </ul>
Core Course XII - BCS5B12 Operating Systems	<ul style="list-style-type: none"> <li>• To learn objectives &amp; functions of Operating Systems.</li> <li>• To understand processes and its life cycle.</li> <li>• To learn and understand various Memory and Scheduling Algorithms.</li> <li>• To have an overall idea about the latest developments in Operating Systems</li> </ul>
Core Course Practical XIII –BCS5B13 Computer Networks	<ul style="list-style-type: none"> <li>• To learn about transmissions in Computer Networks.</li> <li>• To learn various Protocols used in Communication.</li> <li>• To have a general idea on Network Administration.</li> </ul>
Core Course Practical XIV – BCS5B14 Programming Laboratory III: Java and PHP Programming	<ul style="list-style-type: none"> <li>• To practice Java programming.</li> <li>• To practice client side and server side scripting.</li> <li>• To practice PHP Programming.</li> <li>• To practice developing dynamic websites.</li> <li>• To practice how to interact with databases through PHP.</li> </ul>
Core Course XV BCS5B15 Programming Laboratory IV: Android and Linux shell Programming	<ul style="list-style-type: none"> <li>• To practice Android programming.</li> <li>• To practice user interface applications.</li> <li>• To develop mobile application.</li> <li>• To practice shell programming</li> </ul>
Core Course XVII BCS5B17 Project Work	To provide practical knowledge on software development process

## **B.Sc. Microbiology**

Upon completion of B.Sc. Microbiology programme, the students will be able to

- Perform the basic techniques related to screening, isolation and cultivation of microorganisms from various sources
- Study the microorganism with regard to morphology, cultural and biochemical characters. It will help to classify the microbes to certain extent.
- Follow the aseptic techniques and conduct the process of sterilization as well as perform the techniques to control the microorganism
- Understand microorganisms and their relationship with the environment,
- Produce and analyze the microbial products at laboratory level
- Conduct the basic research with these microorganisms and perform the diagnostic procedures required in food, milk and pharmaceutical industries.

### **COURSE OUTCOMES**

#### **PAPER 1: GENERAL MICROBIOLOGY**

- Get an idea about the historical events in microbiology
- Understand the diversity in microbiology
- Know the scope of microbiology
- Know the details about bacterial staining techniques

#### **PAPER 2: MICROBIAL PHYSIOLOGY AND TAXONOMY**

- Understand the taxonomic classification of microorganisms
- Understand concepts of growth and reproduction of bacteria.

#### **PAPER 3: ENVIRONMENTAL AND SANITATION MICROBIOLOGY**

- Different techniques used to treat solid and liquid waste.
- Methods of air sampling and monitoring
- Bioremediation and biodegradation of xenobiotic compound

#### **PAPER 4: INDUSTRIAL MICROBIOLOGY**

- Design and application of bioreactor
- Production of few microbial products
- Downstream processing and recovery

#### **PAPER 5: FOOD AND DIARY MICROBIOLOGY**

- Food as a substrate for microorganisms
- Understand food fermentations
- Food poisoning and preservation and sanitation

### **PAPER 6: SOIL AND AGRICULTURAL MICROBIOLOGY**

Soil microbiology and biogeochemical cycles  
Various plant pathogens , disease ,and its control  
Biocontrol agents

### **PAPER 7: MOLECULAR BIOLOGY AND BIOINFORMATICS**

Bacterial genome organisation  
DNA damage and repair  
Gene regulation in prokaryotes  
Biological databases for protein and nucleic acid  
Software used in the bioinformatics

### **PAPER 8: GENETICS AND GENETIC ENGINEERING**

Various methods used for genetic recombination  
GM food development  
modified plant and animal varieties  
Gene therapy

### **PAPER 9 : MEDICAL MICROBIOLOGY**

Various concepts of medical microbiology  
Various microbial disease outbreak  
Various bacterial disease , their causative agent, mode of infection , epidemiology , treatment ,lab diagnosis ,prophylaxis.

### **PAPER 10: IMMUNOLOGY**

Immune system and immune response  
Detail procedure of hypersensitivity  
Immune response to infections and diseases

### **PAPER 11: CELL AND TISSUE CULTURE**

Animal and plant cell culture  
Plant regeneration  
Application of tissue culture

## **COMPLEMENTARY COURSE**

### **PAPER 1: ENZYMOLOGY AND METABOLISM**

Basic enzymology and enzyme kinetics  
Factors effecting enzyme

### **PAPER 2: METABOLISM**



Different metabolic pathways  
Anearobic and aerobic pathways  
Photosynthesis

### **PAPER 3: ELEMENTARY BIOCHEMISTRY**

physical aspects of biochemistry  
Biochemical techniques

### **PAPER 4: ELEMENTARY BIOCHEMISTRY 2**

Introduction to biomolecules  
Structures ,Functions of biomolecules

## **B A History**

### **Program Specific Outcomes**

#### **PSOs of B.A History**

PSO1. *Understand* background of our religion, customs institutions, administration and so on.

PSO2. *Understand* the present existing social, political, religious and economic conditions of the people.

PSO3. *Analyze* relationship between the past and the present is lively presented in the history.

PSO4. Develop *practical skills* helpful in the study and understanding of historical events. They:

- (a) Draw historical maps, charts, diagrams etc.
- (b) Prepare historical models, tools etc.

PSO5 .Develop *interests* in the study of history and activities relating to history. They:

- (a) Collect ancient arts, old coins and other historical materials;
- (b) Participate in historical drama and historical occasions;
- (c) Visit places of historical interests, archaeological sites, museums and archives;

- (d) Read historical documents, maps, charts etc.
- (e) Play active roles in activities of the historical organizations and associations; and
- (f) Write articles on historical topics.

PSO6. The study of history helps to impart moral education.

PSO7. History installs the feeling of patriotism in the hearts of the pupils.

### **COURSE OUTCOMES COs OF THE COURSE B.A HISTORT HIS1BO1 THE TRENDS IN HISTORIOGRAPHY**

CO1. Produce written work that incorporates consideration of the relevant historiography along with the theory that informs it

CO2. Construct original historical arguments based on primary source material research.

CO3. Demonstrate a superior quality of writing both in terms of mechanics and in developing an argument effectively

CO4. Develop an ability to convey verbally their thesis research and relevant historiography and theory.

### **HIS2BO2 HISTORY OF THE EARLY WORLD**

CO1. It proposes the idea that humankind as a whole has a history to be investigated and that a world history course may be more than study of various “cultures,” each disconnected from the others.

CO2. It has a unified chronology. That is, it organizes the human past into nine Big Eras, each of them encompassing changes around the globe. The curriculum does not use civilizations and their exclusive chronologies as the main units of history, even though developments within major societies are richly explored.

CO3. It encourages educators to think explicitly about the aims of world history education and about the knowledge and understandings that they expect their students to achieve.

CO4. It is conceived on the premise that students will achieve will greater competence in world history and more successfully meet content and performance standards, if they are guided to relate particular subject matter to larger patterns of historical meaning and significance.

CO5. Classify nature of pre historic societies

Co6. Identify Palaeolithic and Neolithic settlements

### HIS3BO3 INFORMATICS AND HISTORY

CO1. Acquiring basic knowledge of the contribution of Information technology to history

CO2. Identify concept of social informatics

## B A Economics

### PROGRAMME OBJECTIVES

economics	<ul style="list-style-type: none"><li>• Imparting knowledge of fundamental concepts and theoretical propositions</li><li>• An understanding of the methodology by which economic ideas are framed, tested and modified.</li><li>• To provide the students an opportunity to take up a career in economics and related areas.</li><li>• An understanding of the economic issues of national and international importance and realize the dynamics behind them.</li><li>• To develop the capacity to analyze the socio-political and economic issues in the language of an economist.</li><li>• To provide an opportunity to understand how the economic policies of the government and governmental institutions affect the common people.</li><li>• An understanding of the institutions – social, political and economic, that influence economic issues.</li></ul>
Programme outcome	<p>The learners are expected to demonstrate the following: :</p> <ul style="list-style-type: none"><li>• Critically evaluate and apply the theories and techniques of economics.</li><li>• Demonstrate subject-specific ‘thinking’ skills that are readily transferable to problem solving and decision making in a wider context.</li><li>• Enhance their lifelong learning, employing a range of practical and professional skills.</li><li>• Find, evaluate, synthesize and use information from a variety of sources</li><li>• Articulate an awareness of the social and community contexts within their disciplinary field</li></ul>
Courses	Outcome
Microeconomics - I	This course is designed to expose first semester students, who may be new to economics, the

	<p>basic principles of microeconomic theory. The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyze real-life situations.</p>
Micro economics - II	<p>This part of the syllabus is designed to introduce fundamental market concepts and structures. The objective of the course is to apply the principles Micro economic analysis to the decision making of firms and market.</p>
Quantitative Methods for Economic Analysis- I	<p>Students are expected to acquire statistical skills that are necessary for further study in most branches of economics. However, it should be kept in mind that the students who study this course have limited quantitative skills. Their limitations and peculiarities should be considered while preparing questions paper, particularly for problems.</p>
Modern Banking and Insurance	<p>This course provides students the latest development in the field of banking and financial system. It also helps to familiarise the students with the changing scenario of Indian banking. The insurance part of the course aims at providing a basic understanding of the mechanics of insurance. It explains the concept of insurance and how it is used to cover risk. Some commonly used insurance terms are included. An over view of major life insurances and general insurances products are added as well.</p>
Quantitative Methods for Economic Analysis - II	<p>The students are to develop skills in mathematical and statistical techniques that are required for a meaningful study of both theoretical and applied economics. This course in quantitative methods will cover the essential topics in mathematics needed for Economic analysis.</p>
Computer Application for Economic Analysis Objectives	<p>It is expected to provide the students with computing skills that are, necessary for easy use of IT. This course will arm the students with the knowledge of fundamentals of computers, word processors, spread sheet, data analysis and the digital economy.</p>
Macro Economics - I	<p>With this course, students are expected to learn the relationships and ideas in the measurement of national income, the theory of income determination, fiscal and monetary policies, the government and its role in the functioning of the economy, etc.</p>
India's Economic Development: National and	<p>To expose the learners to some of the key issues facing the Indian economy both at national and regional levels. In this process, students are expected to be sensitised about these issues, appreciate</p>

Regional Objectives	and learn to critically assess the role of the government in various economic spheres. The learners are also exposed to numerical information relating to various aspects of Indian economy and India's economic policies. They are expected to develop analytical skills, interpret the economic events and visualise the economic future of India.
Economics of Capital Market	This course is designed to give an exposure to the students of economics to the changing world of financial markets and to give them an opportunity to familiarize with the basic concepts related to capital market and to understand the economics of capital market. The course also aims at providing a platform to students of economics in developing the skills required to take up a career in financial sector and to provide them an opportunity to think of higher studies in finance which may open them the vast career opportunities in the field of finance.
International Economics	The basic aim of this introductory course on international economics is to present before the students the questions, and answers, related to international economic relations. The students are expected to acquire skill that will help them to take rational decisions in issues related to international economics. business firms, use these theories and results to formulate their strategies.
Macroeconomics-II	The objective is to familiarise the students in the application of principles of macroeconomic analysis to the day-to-day decision-making in the aggregate economy. This course is expected to develop skill in economic reasoning, This vital skill is expected to help them in understanding and solving aggregate economic problems.
Mathematical Economics	This course is aimed at introducing students to the most fundamental aspects of mathematical economics and econometrics. It also aims at developing critical thinking, and problem-solving, empirical research and model building capabilities. The students will acquire mathematical skills which will help them to build and test models in economics and related fields.
Public Finance	The basic aim of this course is to introduce students to the application of the techniques, methods and principles of Economics to decision making in public finance. The students are expected to learn how the principles of economics can be applied to sound decision making in public finance. They are also expected to learn all the important economic issues that government agents face.
Development Economics	This course is expected to provide students a comprehensive approach towards issues related to development and planning. The

	students are expected to develop an interrelated approach to resource use, the relationship between man and man and man and nature.
<b>Economics in everyday life</b>	This course is an open course which will be offered to only those students for whom Economics is not the core course. The purpose of this paper is to introduce a non-economics student to the subject matter of economics by familiarising with the most basic concepts of economics. Special attention is given to include concepts that are used in everyday life
Project Work	Project work is meant for providing an opportunity to approach and study a problem in a systematic and scientific manner. It provides them an opportunity to apply the tools they have studied and learn the art of conducting a study and presenting the report in a structured way.

## BA ENGLISH LANGUAGE AND LITERATURE

PROGRAMME OUTCOME	Developing intellectual, personal and professional abilities through effective communicative skills; ensuring high standard of behavioural attitude through literary subjects and shaping the students socially responsible citizens.
PROGRAMME SPECIFIC OUTCOME	On successful completion of the Programme, the students will be accurate both in oral and written communication as they will be strong in Grammar and its usage.
	They can express a thorough command of English and its linguistic structures.
	They can apply critical frameworks to analyze the linguistic, cultural and historical background of texts written in English.
	They will be familiar with the conventions of diverse textual genres including fiction, non-fiction, poetry, autobiography, biography, Journal, film, plays, editorials etc.
<b>COURSES</b>	<b>OUTCOMES</b>

ENG1A01:TRANSACTIONS:ESSENTIAL ENGLISH LANGUAGE SKILLS	To impart the necessary macro and micro English language skills to the learners to enable them to express their feelings, opinions, ideas and thoughts fluently and accurately in a variety of personal and professional contexts.
	To create in learners a definitive sense of the stylistic variations of English and how they are used in real life situations.
	To inculcate in learners a taste for deeper pursuit and acquisition of advanced level of skills in English.
	To guide them on how to participate in discussions and make seminar presentations with special focus on specific vocabularies and styles of usage in such contexts.
ENGLA02:WAYS WITH WORDS:LITERATURES IN ENGLISH	To help students develop the acumen to read, appreciate and discuss literature.
	To introduce students to the linguistic qualities of a literary text and to unravel the many meanings Of the text
	To acquaint the students with different genres of literature and to analyse them.
ENG2 A03: WRITING FOR ACADEMIC AND PROFESSIONAL SUCCESS	To develop writing skills, to learn to integrate writing and thought and to apply the conventions of academic writing correctly.
	To acquire the correct sense of format, syntax, grammar, punctuation and spelling.
	To acquire concepts, principles and vocabulary of reasoning and argumentation and use analysis, synthesis, and evaluations to advance arguments.
	To gain an understanding of discourse conventions ranging from structure and paragraphing to tone and mechanics
ENG2 A04: ZEITGEIST:READINGS ON CONTEMPORARY CULTURE	To inculcate the values enshrined in the constitution of India and to provide an insight on the secular framework of the country.
	To familiarize the learners with concepts such as conservation, sustainability and the life of the marginalized and their interconnectedness.
	To foster among the learners an awareness of the diverse problems faced by women and the sexual minorities and to promote a culture of inclusion and mutual respect.

	To understand the "human' as articulated among the various cultures and promote a multicultural and plural understanding of rights.
ENG3 A05: SIGNATURES:EXPRESSING THE SELF	*To enable the students to read and critically appreciate the different genres of expressing the self.
	*To appreciate the fluid and flexible narratives of self expression that transcend the conventions of genre
	*To understand how personal narratives intersect with the larger social realities
	*To read personal narratives that move beyond the individual self to express the collective self
	*To understand how the distinctions between fact and fiction blur in personal narratives
ENG4 A06 SPECTRUM:LITERATURE AND CONTEMPORARY ISSUES	*To make the learners aware of the humanist dimensions of literature and media in the contemporary world
	* To enable the learners to understand concepts like globalization, commercialization and intellectual property rights through new literatures.
	* To inculcate the spirit of universal brotherhood by presenting critique of race, xenophobia, war and national borders.
	* To disseminate knowledge about the rights of minorities such as children, animals and the disabled and thus create a positive change in the societal perception of them.
ENG1B1: READING POETRY	To introduce the students to the basic elements of poetry, including the stylistic and rhetorical devices employed in poetry, and to various genres of poetry.
	To train students in various perspective readings in poetry like gender, race, caste, ethnicity, religion, region, environment and nation etc.
ENG2B1: READING PROSE	• To enable the students to identify the specificities of various modes of prose writing and to equip them to write prose in as many different modes as possible
	• To develop the critical thinking ability of the student to respond to various modes of prose writings in relation to their socio-historic and cultural contexts.
ENG3B01: READING DRAMA	• To develop a critical understanding of drama and various kinds of theatre and a range of dramatic skills and techniques.



	<ul style="list-style-type: none"> <li>• To familiarize students with the cultural diversity of the world</li> <li>• To provide students with a meaningful context for acquiring new language and developing better communication skills</li> </ul>
	<ul style="list-style-type: none"> <li>• To foster a strong sense of involvement which motivates and encourages students to learn through active participation</li> </ul>
	<ul style="list-style-type: none"> <li>• To facilitate exploration of attitudes, values and behaviour and creation of roles and relationships so that the student gains an understanding of themselves and others through dramatic, imaginative experience</li> </ul>
	<ul style="list-style-type: none"> <li>• To develop confidence and self-esteem in their relationships with others and sensitivity towards others</li> </ul>
ENG3B02: READING FICTION	<p>To develop a critical understanding of fiction</p> <ul style="list-style-type: none"> <li>• To familiarize students with the cultural diversity of the world and to extend various perspective readings</li> <li>• To provide students with a meaningful context for acquiring and memorizing new language and developing oral skills</li> <li>• To cultivate a sense of involvement which motivates and encourages students to learn through active participation</li> </ul>
ENG4B01: MODERN ENGLISH LITERATURE	<p>To understand the political, religious, social and cultural trends of the Modernist and the Postmodernist periods.</p> <ul style="list-style-type: none"> <li>• To understand how the literature of the period relates to the important trends of the period.</li> <li>• To develop an ability to read, understand and respond to a wide variety of texts of the period.</li> <li>• To appreciate the ways in which authors achieve their effects and to develop skills necessary for literary study.</li> <li>• To develop the ability to construct and convey meaning in speech and writing matching style to audience and purpose.</li> </ul>
ENG4B02: METHODOLOGY OF HUMANITIES	<p>To know the distinction between the methodologies of natural, social and human sciences</p> <ul style="list-style-type: none"> <li>• To understand the questions concerning the relation between language and subjectivity as well as those pertaining to structure and agency in language</li> <li>• Aware the theories of textuality and reading both western and Indian</li> </ul>

<p>ENG5B01: NDIAN WRITING IN ENGLISH</p>	<p>*To provide an overview of the various phases of the evolution of Indian writing in English.</p> <p>*To introduce students to the thematic concerns, genres and trends of Indian writing in English.</p> <p>*To generate discussions on the constraints and challenges encountered in articulating Indian sensibility in English.</p> <p>*To expose students to the pluralistic aspects of Indian culture and identity.</p>
<p>ENG5B02: LANGUAGE AND LINGUISTICS</p>	<p>To lead to a greater understanding of the human mind, of human communicative action and relations through an objective study of language</p> <ul style="list-style-type: none"> <li>• To familiarize students with key concepts of Linguistics and develop awareness of latest trends in Language Study</li> <li>• To help students towards a better pronunciation and to improve the general standard of pronunciation in every day conversation and in reading.</li> <li>• To help the students develop a sense of English grammar, idioms, syntax and usage.</li> <li>• To improve writing and speech skills.</li> </ul>
<p>ENG5B03: METHODOLOGY OF LITERATURE</p>	<p>To introduce and discuss the evolution of literature</p> <ul style="list-style-type: none"> <li>• To sensitize the student to his own readings, to develop a critical sensibility, to inculcate a love of literature, and to instill a serious approach to literature.</li> <li>• To enable the student to read literature using critical and theoretical schools viz. textual approaches - New Critical, psychoanalytic, gender based, ethnic , subaltern , post-colonial, cultural, archetypal, postmodern, ecological perspectives.</li> </ul>
<p>ENG5B04: INFORMATICS</p>	<ul style="list-style-type: none"> <li>• The student will have a thorough general awareness of Computer hardware and software from a practical perspective.</li> <li>• The student will have good practical skill in performing common basic tasks with the computer.</li> </ul>
<p>ENG6B01: LITERARY CRITICISM AND THEORY</p>	<p>To make the students aware that all readers are critics</p> <ul style="list-style-type: none"> <li>• To familiarise them with the factors involved in criticism like interpretation, elucidation, judgement and appreciation.</li> <li>• To introduce the students to basic texts in criticism, relating to various movements and schools of thought</li> <li>• To develop critical thinking by introducing various tools of criticism-analysis, comparison, theoretical</li> </ul>

	approaches etc.
ENG6B02: LITERATURES IN ENGLISH: AMERICAN & POST COLONIAL	To initiate the students to varied literatures in English
	<ul style="list-style-type: none"> <li>• To expose them to diverse modes of experiences and cultures</li> <li>• To familiarize them with the concepts of Post Colonialism</li> <li>• To enable students to compare and contrast their indigenous literature and culture with other literatures and cultures.</li> </ul>
ENG6B03: WOMEN'S WRITING	o To enable students to identify concepts of class, race and gender as social constructs and interrelated throughout women's lives
	o To lead them to explore the plurality of female experience in relation of these
	o To equip them with analytical, critical and creative skills to interrogate the biases in the construction of gender and patriarchal norms
ENG6B04: WRITING FOR THE MEDIA	Understand the nature of news, the role of journalism, advertising in a democratic society, the ethical and legal restrictions on media writing, and the criteria for writing excellence.
	• Master the basic writing and reporting skills for various media, including news writing for print and broadcast media, and advertising copywriting.
	• Think critically about writing for the media (specifically broadcast journalism, digital media and advertising); develop and apply media writing skills.
	• Exhibit competence in the mechanics of concise and clear writing through the use of acceptable grammar, correct spelling, proper punctuation, and appropriate AP style.
ENG6B05E01: WORLD CLASSICS IN TRANSLATION	To introduce students to the world's best classics in translation. • To generate a broad vision of life by making the students to come to grips with universal problems and varied life situations. • To make the students to have a feel of excellent classics in translation in various genres-Poetry, Fiction, Short Story and Drama-by a judicious selection. It should instill in the students a spirit of enquiry and further exploration.
ENG5D03: APPLIED LANGUAGE SKILLS (OPEN COURSE)	Fulfil their educational and professional goals as they relate to their knowledge and use of the English language.

	<ul style="list-style-type: none"> <li>• Gain a sound functional competence in the English language without the impediment of language difficulties.</li> </ul>
	<ul style="list-style-type: none"> <li>• Overcome difficulties cropping up at the time of interviews, in group discussions, or during entrance examinations.</li> </ul>
	<ul style="list-style-type: none"> <li>• Develop a high level of proficiency in all skill areas of the English language in an integrated curriculum.</li> </ul>
	<ul style="list-style-type: none"> <li>• Develop a solid understanding and usage of academic English. • Attain an appropriate level of expertise in the skill area: reading, listening comprehension, grammar, writing and verbal skills.</li> </ul>
Project Work	The aim of the Project work is to acquire practical knowledge on the implementation of perceptions studied through the programme.

## B Com

**PO1:** Familiarize basic characteristics of commerce and industry and analyze the operation of different organizations in different dimensions.

**PO2:** Understanding the economy as whole and evaluate the role played by various components like households, markets, financial institutions, companies, government etc.

**PO 3:** Learn the market and its working mechanism and marketing process

**PO4:** Demonstrate leadership qualities required to lead the diverse teams and small groups to achieve the common goals of the organization

**PO5:** Apply the different tools and techniques for solving the problems in their work environment and field of study.

**PO 6:** Develop a general idea regarding career opportunities in job market and clear view of demanding skills to be acquired for the respective jobs

**PO7:** Pursue higher education in the field of commerce, business and finance with the clear understanding of basic concepts required

**PO 8:** Prove proficiency to qualify competitive professional examinations at national and international level;

**PO 9:** Develop business ideas and start ventures through the knowledge imparted during the program

**PO10:** Apply skills in using software like ERP, Accounting Software, Equity trading Apps etc

## **PSO- B.Com Computer Application**

**PSO-1:** Understand the basics of computer application in business

**PSO-2:** Know basic idea regarding E- commerce, E- Business, Digital marketing etc.

**PSO-3:** Acquire skills in office automation tools, computerized Accounting, ERP.

1	BCMIB01 BUSINESS MANAGEMENT	<ol style="list-style-type: none"><li>1- To understand the process of business management and its functions.</li><li>2- To familiarize the students with current management practices</li><li>3- To understand the importance of ethics in business</li><li>4- To acquire knowledge and capability to develop ethical practices for effective management.</li></ol>
2	BCM2B02 FINANCIAL ACCOUNTING	<ol style="list-style-type: none"><li>1- To equip the students with the skills of preparing financial statements for various type of organizations.</li><li>2- To enable the students to acquire knowledge about financial reporting standards</li><li>3- To understand corporate accounting methods.</li></ol>
3	BCM3BO3 BUSINESS REGULATIONS	<ol style="list-style-type: none"><li>1- To familiarize the students with certain statutes concerning and affecting business organizations in their operations.</li><li>2- To familiarize the students with rules of Indian Contract Act.</li><li>3- To impart the details of Sale of Goods Act to the students.</li><li>4- To create an understanding on Consumer rights to the students.</li><li>5- To familiarize the students with LLP Act</li></ol>
5	BCM3 BO4 CORPORATE ACCOUNTING	<ol style="list-style-type: none"><li>1- To help the students to acquire conceptual knowledge of the fundamentals of the corporate accounting</li><li>2- To enable the students in applying relevant accounting standards.</li><li>3- To develop the techniques of preparing the financial statements of companies.</li><li>4- To equip the students with the current employment requirement in the field of accounting.</li></ol>

6	BCM4B05 COST ACCOUNTING	<ul style="list-style-type: none"> <li>1- To familiarize the students with the various concepts and elements of cost.</li> <li>2- To create cost consciousness among the students.</li> <li>3- To deal with various costing techniques to be used in current work environment.</li> <li>4- To apply cost control techniques.</li> </ul>
7	BCM4B06 CORPORATE REGULATIONS	<ul style="list-style-type: none"> <li>1- To familiarise the students with corporate law through companies act 2013.</li> <li>2- To understand how to set up a company and familiarise the authorities involved in regulation of companies like, ROC, SEBI, NCLT.</li> <li>3- To make general awareness on the managerial operation of a company.</li> <li>4- To make them aware of the importance of corporate governance in the management of organizations.</li> </ul>
8	BCM5B07 ACCOUNTING FOR MANAGEMENT	<ul style="list-style-type: none"> <li>1- To enable the students to understand the concept and relevance of Management Accounting.</li> <li>2- To provide the students an understanding about the use of accounting and costing data for planning, control, and decision making.</li> <li>3- To enable students to take apt decision by using accounting information</li> </ul>
9	BCM5B08 BUSINESS RESEARCH METHODS	<ul style="list-style-type: none"> <li>1- Acquire basic knowledge in business research methods</li> <li>2- Learns how to identify a research problem</li> <li>3- To develop basic skills to conduct survey researches and case studies.</li> </ul>
10	BCM5 B09 Income Tax Law and Accounts	<ul style="list-style-type: none"> <li>1- To impart basic knowledge and equip students with application of principles and provisions Income - tax Act, 1961 amended up to date.</li> </ul>
11	BCM 5 B10 Computer Applications in Business	<ul style="list-style-type: none"> <li>1- Learns applications of computer in business</li> <li>2- Work with word processing and spreadsheet software</li> <li>3- Apply MS excel in work environment</li> </ul>
12	BCM 5 B11 Business Information System	<ul style="list-style-type: none"> <li>1- Basic understanding of information systems used by the business entities</li> <li>2- Understand relevance and use of DBMS</li> <li>3- Familiarise ERP</li> </ul>
13	BCM6 B12 Income Tax and GST	<ul style="list-style-type: none"> <li>1- To impart basic knowledge and equip students with application of principles and provisions Income - tax Act, 1961</li> <li>2- To understand GST Act 2016.</li> <li>3- To make them aware of GST mechanism in India</li> </ul>
13	BCM6B13 AUDITING AND CORPORATE GOVERNANCE	<ul style="list-style-type: none"> <li>1- Understand knowledge of auditing principles and techniques</li> <li>2- To familiarize the students with the issues and practices of corporate governance in the global and</li> </ul>

		Indian context.
14	BCM6 B 14 Office Automation Tools	<ol style="list-style-type: none"> <li>1- Practically learns MS Office</li> <li>2- Uses various software in work environment</li> <li>3- Understand basics of Ms Access</li> <li>4- Learns basic internet and surfing skills</li> </ol>
15	BCM6 B 15 Computerised Accounting with Tally	<ol style="list-style-type: none"> <li>1- Acquire basic knowledge of Computerised Accounting</li> <li>2- Learns accounting with tally</li> <li>3- Integrate accounts and inventory</li> <li>4- Apply GST in Tally</li> <li>5- Generating reports and audit in Tally</li> </ol>
16	BC 1 C01 Managerial Economics	<ol style="list-style-type: none"> <li>1. Understand basic theories of Economics</li> <li>2. Identify characteristics of Indian economy any problems</li> <li>3. Learn market structure</li> <li>4. Analyse the consumer behaviour</li> </ol>
17	Bc2 C02 Marketing Management	<ol style="list-style-type: none"> <li>1. Differentiate market &amp; marketing</li> <li>2. Apply marketing techniques in relevant field of work</li> <li>3. Learns sales promotion techniques</li> <li>4. Understands distributions network and logistics</li> </ol>
18	BCM3C03 Human Resources Management	<ol style="list-style-type: none"> <li>1- To familiarise the Human Resource Management</li> <li>2- To familiarize the students with the different aspects of managing human resources in an organization.</li> <li>3- To equip the students with basic knowledge and skills required for the acquisition, development and retention of human resources</li> </ol>
20	BCM4C04 QUANTITATIVE TECHNIQUES FOR BUSINESS	<ol style="list-style-type: none"> <li>1- familiarize student with the use quantitative techniques in managerial decision making</li> <li>2- Understanding the use of various statistical tools and techniques in business</li> </ol>
21	BCM5D03 BASIC ACCOUNTING	<ol style="list-style-type: none"> <li>1- To enable the students to acquire knowledge of Accounting Principles and Practice</li> <li>2- Learns journalising &amp; Ledger posting,</li> <li>3- Prepare financial statement</li> </ol>
22	BCM3A11 BASIC NUMERICAL METHODS	<ol style="list-style-type: none"> <li>1- To enable the students to acquire knowledge of numerical equations, matrices progressions, financial mathematics and descriptive statistics.</li> <li>2- At the end of this course, the students will be able to understand, numerical equation</li> </ol>
23	BCM3A12 PROFESSIONAL BUSINESS SKILLS	<ol style="list-style-type: none"> <li>1- To update and expand basic Informatics skills of the students</li> <li>2- To equip the students to effectively utilize the digital knowledge resources for their study</li> </ol>
24	BCM4A13 ENTREPRENEURSHIP DEVELOPMENT	<ol style="list-style-type: none"> <li>1- To familiarize the students with the concept of entrepreneurship.</li> <li>2- To identify and develop the entrepreneurial talents of the students.</li> </ol>

		3- To generate innovative business ideas in the emerging industrial scenario.
25	BCM5A14 Banking and Insurance	1- To basic knowledge about the structure, organization 2- Working of financial system in India. 3- To make an understanding on roles played by the financial institutions in economy 4- To familiarise banking practices

## BBA

PROGRAMME OUTCOME	This programme could provide well trained professionals for the industries, banking sectors, insurance companies, financial companies, transport agencies, warehousing etc., to meet the well trained man power requirements. The graduates will get hands on experience in various aspects acquiring skills for managers, overall administration abilities of the company.
PROGRAMME SPECIFIC OUTCOME	The students should possess the knowledge, skills and attitudes during the end of the B. B . A Degree course. By virtue of the training they can become a managers, trainers, Professors and various government jobs etc.
<i>Courses</i>	<i>Outcome</i>
MANAGEMENT CONCEPTS AND BUSINESS ETHICS	<ul style="list-style-type: none"> <li>· To understand the process of business management and its functions</li> <li>· To familiarize the students with current management practices.</li> <li>· To understand the importance of ethics in business, and</li> <li>· To acquire knowledge and capability to develop ethical practices for effective management.</li> </ul>
FINANCIAL ACCOUNTING	<ul style="list-style-type: none"> <li>. To enable the students to acquire knowledge of the financial accounting principles and practices</li> <li>. To equip the students with skills for recording various kinds of business transactions</li> <li>. To familiarize the students with the techniques of preparing financial statements</li> </ul>
BUSINESS REGULATORY	To provide students with Basic Legal Concepts and the Indian Legal Environment in which Business is carried on. To enable the students to understand the emerging legal



FRAMEWORK	issues in a digital networked environment
ORGANISATIONAL BEHAVIOR	To familiarize the students with the basic concepts of the organizational behavior and to enhance their understanding of the interaction between the individuals and the organizations.
MARKETING MANAGEMENT	To acquaint the students with the marketing principles and practices, and, To understand the process of marketing in a business firm.
FINANCIAL MANAGEMENT	To familiarize the students with the concepts, tools and practices of financial management, and, To learn about the decisions and processes of financial management in a business firm.
ACCOUNTING FOR MANAGEMENT	To enable the students to understand the concept and relevance of management Accounting <input type="checkbox"/> To provide the students an understanding about the use of accounting and costing data for planning, control and decision taking.
BUSINESS RESEARCH METHODS	To enable students for acquiring basic knowledge in business research methods and to develop basic skills in them to conduct survey researches and case studies
EMERGING TRENDS IN MANAGEMENT	To Impart knowledge about the emerging trends of new management concepts, and To provide knowledge about the significance of the integration of information technology as the platform for the application of various management concepts
OPERATIONS MANAGEMENT	To familiarize the students with the concepts, tools and practices of operations management, and, To learn about the decisions and processes of operations management in a business firm.
HUMAN RESOURCES MANAGEMENT	To give a conceptual understanding of human resource practices in organizations.
INDIAN FINANCIAL SYSTEM	To give a detailed idea about the Indian financial system and its broad components

INVE	. To give an overall idea about different investment avenues available in financial markets and prepare them with basic skills and knowledge to manage investment.
INCOME TAX	To impart basic knowledge and equip students with application of principles and provisions Income-tax Act, 1961 amended up-to-date To familiarize the students with role of different prominent services in India and prepare them with basic skills to manage.
E- COMMERCE	To understand the importance of database systems for business management, and, To gain a practical orientation to database development and maintenance.
CONSUMER BEHAVIOR	To understand the basics of consumer decision-making processes, and, To understand the information needs for helping the consumer in decision making
RETAIL MANAGEMENT	To give an overview of the conceptual aspects of retail marketing management and to give some practical functional aspects of retailing.
HUMAN RESOURCES PLANNING AND DEVELOPMENT	To give the students a deep understanding of process of HR planning, and To familiarize them with the methods for HR development.
MANAGERIAL ECONOMICS	To enable the students to understand the micro and macroeconomic concepts relevant for business decisions □To help the students to understand the application of economic principles in business management
IT FOR BUSINESS &MANAGEMENT	1. To familiarize the students with the use of IT for business and management  To make them proficient in using computer for routine tasks like data retrieval, data analysis, accounting and report generation
QUANTITATIVE TECHNIQUE FOR BUSINESS MANAGEMENT	To familiarize the student with the use of quantitative techniques in managerial decision making.
MANAGEMENT SCIENCE	To provide a basic knowledge about Operations research and

	To acquaint the students some common operations Research Tools for various Business decision marketing situations
E- COMMERCE	To understand the importance of database systems for business management, and, To gain a practical orientation to database development and maintenance.
BANKING AND INSURANCE	To enable the students to acquire knowledge about basics of Banking and Insurance. To familiarise the students with the modern trends in banking

## M. Sc Physics

After successful completion of two year post graduate program in Physics a Student should be able to:

### ❖ PROGRAMME OUTCOMES

- **PO-1** Demonstrate, solve and have an understanding of major concepts in all Disciplines of Physics
- **PO-2** Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of most of the physics Experiments.
- **PO-3.** Create an awareness of the impact of Physics on the environment, society, and development outside the scientific community.
- **PO-4** Find out the green route for developing technologies and thus helping in sustainable development.
- **PO-5.** Inculcate the scientific temperament in the students and outside the scientific community.
- **PO-6.** Use modern techniques, scientific equipments and software which is helpful in Physics

### ❖ PROGRAMME SPECIFIC OUTCOMES

- **PSO-1** Gains useful knowledge about all fundamental aspects of different elementary branches of Physics
- **PSO-2** Understands the background of basic electronic devices, mathematical tools, classical- quantum – statistical aspects of physics, methods implemented for scientific explorations through experiments, nanotechnology, and spectroscopic background of different materials and implements them for the analysis of different materials
- **PSO-3** Gathers a basic knowledge on thermal energy transactions and the mechanism behind the reactions, quantum mechanical physics, numerical and mathematical methods implemented in physics, python programming
- **PSO-4** Gathers information about the physical aspects of atomic structure, dual behavior, reaction pathways with respect to time, various energy transformations, molecular assembly in nano level.

- **PSO-5** Carry out experiments in the area of electronics, thermodynamics, nuclear physics, programming, modern physics and material physics and nanotechnology.

❖ **COURSE OUTCOMES**

SL NO	COURSE	OUTCOMES
<b>SEMESTER I</b>		
1.	<b>CLASSICAL MECHANICS</b>	CO-1→Learn Lagrangian and Hamilton formulation CO-2→Understand the classical background of quantum mechanics. CO-3→Learn kinematics and dynamics of rigid body CO-4→Study the small oscillations problems CO-5→Learn nonlinear equations and understand the concept of chaos
2.	<b>MATHAMATICAL PHYSICS</b>	CO-1→Learn different type of coordinate systems and understand curl, divergent, gradient and its physical significance CO-2→Learn the concept of matrix and tensors and its properties CO-3→solve second order differential equations through different methods CO-4→To understand special functions CO-5→Study Fourier series and Fourier transforms
3.	<b>ELECTRODYNAMICS AND PLASMA PHYSICS</b>	CO-1→Understand time varying field and Maxwellequations. CO-2→Learn about plane electromagnetic waves. CO-3→Know transmission lines, wave guide, and cavity resonators. CO-4→Learn the relativistic electrodynamics. CO-5. →Know the concept of plasma and its properties.
4.	<b>ELECTRONICS</b>	CO-1→Study the construction and characteristics of JFET and MOSFET CO-2→Learn different type of photonic devices and its characteristics CO-3→To understand the OPAMP and its parameters CO-4→Know applications of OPAMP CO-5→Understand the world of digital electronics

<b>SEMESTER II</b>		
<b>1.</b>	<b>QUANTAM MECHANICS</b>	CO-1→To study the basic postulates of quantum mechanics. CO-2→To get clear an idea about quantum dynamics C-O3→To understand angular momentum CO-4→To know the central potential problems CO-5→Learn the invariance principles and conservation laws
<b>2.</b>	<b>MATHAMATICAL PHYSICS II</b>	CO- 1→Understand the complex variables and solve problems CO- 2→Learn group theory and solve problems CO- 3→know the calculus of variables CO-4→solve integral equations CO-5→know green function
<b>3.</b>	<b>STATISTICAL MECHANICS</b>	CO-1→To understand the statistical basis of thermodynamics. CO-2→To get insights into the concept of ensemble, micro canonical ensemble and grand canonical ensemble. CO-3→To know the formulation of quantum statistics. CO-4→To understand the thermodynamics of ideal Bose system. CO-5→To understand the thermodynamics of ideal Fermi system.
<b>4.</b>	<b>COMPUTATIONAL PHYSICS</b>	CO-1→To understand the basis of python language and its keywords CO-2→To know the NumPy module and plotting techniques. CO-3→understand numerical methods and solve problems. CO-4→Learn to write python programs
<b>PRACTICAL I &amp; II</b>		
<b>1.</b>	<b>GENERAL PHYSICS</b>	CO-1→To get the concepts of classical experiments in physics CO-2→to develop skills to assemble, record and analyse the results
<b>2.</b>	<b>ELECTRONICS</b>	CO-1→To get the concepts of Eleectronics CO-2→to develop skills to assemble, record and analyse the results
<b>SEMESTER-III</b>		
<b>1.</b>	<b>QUANTAM MECHANICS II</b>	CO-1→.To understand time dependent perturbation theory. CO-2→Learn to solve problems using variation and

		WKB approximations. CO-3→Know the scattering problems. CO-4→Know the time independent perturbation theory. CO-5→To understand relativistic quantum mechanics.
2.	<b>NUCLEAR PHYSICS</b>	CO-1→To know nuclear forces and its properties. CO-2→To get an idea about nuclear decay CO-3→To know nuclear fission, fusion CO-4→Understand radiation accelerators and nuclear electronics. CO-5→Learn nuclear particles and conservation laws.
3.	<b>SOLID STATE PHYSICS</b>	CO-1→To understand the basic of crystal structure and binding CO-2□→To get an idea about lattice vibrations CO-3→To know electron state and semiconductors CO-4→ To get clear idea about dielectric, Ferro electric, and magnetic properties of solid CO-5→Learn about superconductivity
4.	<b>EXPERIMENTAL TECHNIQUES</b>	CO-1→.To understand different vacuum pumps CO-2→Learn different thinfilm coating techniques. CO-3→. Learn different accelerator techniques. CO-4→To understand material analysis by nuclear techniques. CO-5→.familiarise the students with the basics of X-ray diffraction techniques.
<b>SEMESTER-IV</b>		
1.	<b>ATOMIC AND MOLECULAR SPECTROSCOPY</b>	CO-1→. Get an idea about atomic spectroscopy. CO-2→. To understand MW and IR spectroscopy. CO-3→. Study the electronic spectroscopy. CO-4→. Understand Raman spectroscopy. CO-5→. Study the spin resonance spectroscopy.
2.	<b>MICROPROCESSOR AND ITS APPLICATIONS</b>	CO-1→To familiarize the students with basics of microprocessor and learns to write programs. CO-2→To understand I/O interfacing techniques. CO-3→To understand the peripheral interfacing CO-4□→To get an over view about microcontroller. CO-5→To get an idea about AVR programing.
3.	<b>MATERIAL SCIENCE</b>	CO-1→To know idea about crystal imperfections CO-2→ To have an idea about phase diagram diffusion in solid. CO-3→ To study the plastic deformation and

		fracture of materials. CO-4→To understand engineering materials CO-5→To learn basics of Nanomaterials
<b>PRACTICAL III &amp; IV</b>		
<b>1.</b>	<b>MODERN PHYSICS</b>	CO-1→ get introduced to the modern methods implemented in physics CO-2→ familiarize with the technologies in the research areas
<b>2.</b>	<b>PYTHON PROGRAMING</b>	CO-1→to seek theory of different experiments CO-2→to develop skills of writing, compiling and debugging the programmes

## M SC CHEMISTRY

After successful completion of two year degree program in Chemistry a Student should be able to;

### ❖ PROGRAMME OUTCOMES

PO-1 Demonstrate, solve and an understanding of major concepts in all Disciplines of chemistry

PO-2 Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.

PO-3.Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

PO-4 Find out the green route for chemical reaction for sustainable development.

PO-5.To inculcate the scientific temperament in the students and outside the scientific community.

PO-6.Use modern techniques, decent equipments and Chemistry software's

### ❖ PROGRAMME SPECIFIC OUTCOMES



PSO-1 Gains complete knowledge about all fundamental aspects of all the elements of chemistry

PSO-2 understands the background of organic reaction mechanisms, complex chemical structures, instrumental method of chemical analysis, molecular rearrangements and separation techniques.

PSO-3 Appreciates the importance of various elements present in the periodic table, coordination chemistry and structure of molecules, properties of compounds, structural determination of complexes using theories and instruments.

PSO-4 Gathers attention about the physical aspects of atomic structure, dual behavior, reaction pathways with respect to time, various energy transformations, molecular assembly in nano level, significance of electrochemistry, molecular segregation using their symmetry.

PSO-5 Carry out experiments in the area of organic analysis, estimation, separation, derivative process, inorganic semi micro analysis, preparation, conductometric and potentiometric analysis

#### ❖ COURSE OUTCOMES

<b>SL N O</b>	<b>COURSE-SEMESTER I</b>	<b>OUTCOMES</b>
1.	<b>QUANTUM MECHANICS &amp; COMPUTATIONAL CHEMISTRY</b>	CO-1. Know the Eigen function, Eigen value, operator and postulates of quantum mechanics. CO-2. Learn two and three dimensional box, mechanics of particle. CO-3. Understand the adsorption of gases by solid type of isotherms CO-4. Recognized the Fock contribution. CO-5. Learn ladder operator and space quantisation.
2.	<b>ELEMENTARY INORGANIC CHEMISTRY</b>	CO-1 Determine and Learn about Dipole moment and bond order of the inorganic molecule. CO-2. Learn about geometry and shape of the molecule. CO-3. Known the preparation and properties of transition metal carbonyls CO-4. To understand the 18 electron rule and its application. CO-5. Find out the point group of inorganic molecules.

		CO-6. Learn molecular orbital and its orientation. CO-7. Learn concept of symmetry elements in molecules.
3.	<b>STRUCTURE AND REACTIVITY OF COMPOUNDS</b>	CO-1. Learn SN1, SN2 and SNi Mechanism and stereochemistry. CO-2. Learn classical and non-classical carbocation, NGP by pi and sigma bonds. CO-3. Solve the elimination problems. CO-4. Distinguish between type of addition, elimination and substitution reaction. CO-5. Learn E and Z nomenclature in C, N, S, P containing compound, Stereochemical relationship R and S.
4.	<b>THERMODYNAMICS, KINETICS &amp; CATALYSIS</b>	CO-1. Learn the thermodynamic description of exact, inexact differential and state function. CO-2. Know the qualitative properties of solution, the depression in freezing point, elevation in boiling point and osmotic pressure. CO-3. Know the statistical thermodynamics and various partition functions. CO-4. Study the steady state approximation Michaelis-Menten mechanism.
	<b>COURSE – SEMESTER II</b>	
1.	<b>GROUP THEORY AND CHEMICAL BONDING</b>	CO-1 To study the basic postulates of quantum mechanics CO-2 To enable the students to solve the simple quantum mechanical models such as simple harmonic oscillator, particle in a 1D- box, rigid rotor, H atom etc. CO-3 To understand the quantum mechanical aspect of angular momentum and spin. CO-4 Enable the students to predict the point group of important molecules and to know how they are classified CO-5 To understand the idea of space groups and to learn the theory of molecular Symmetry. CO-6 To gain skill to apply group theory to vibrational and electronic spectroscopy

2.	<b>COORDINATION CHEMISTRY</b>	CO- 1 To know the structure and bonding of important coordination compounds CO- 2 To understand the magnetic properties of complexes and to know how magnetic moments can be employed for the interpretation of their structure CO- 3 To get an overview about the stereochemistry of coordination compounds
3.	<b>REACTION MECHANISM IN ORGANIC CHEMISTRY</b>	CO-1 To know the various methods employed for reactions like oxidation, reduction, carbocyclic and heterocyclic ring formation etc. CO-2 To get insights into novel reactions and reagents in organic synthesis CO-3 To know the utility of protecting group strategy in organic synthesis CO-4 To be familiarize the students with the basic principles of retro syntheses, biosynthesis and biomimetic synthesis
4.	<b>ELECTROCHEMISTRY, SOLID STATE, AND STATISTICAL THERMODYNAMICS</b>	CO-1 To know the basic concepts in classical thermodynamics and to learn the thermodynamic aspects of various processes and reactions CO-2 To understand the different aspects of statistical thermodynamics and its applications.
	<b>COURSE- PRACTICAL I &amp; II</b>	
1.	<b>PHYSICAL CHEMISTRY</b>	CO-1. Calculate molar and normal solution of various concentrations. CO-2. Determine specific rotations and percentage of optically active substances by polarimetrically. CO-3. Study the energy of activation and second order reaction. CO-4. Study the stability of complex ion and standard free energy change and equilibrium constant by potentiometry. CO-5. Find out the acidity, Basicity and PKa Value on Ph meter.
2.	<b>ORGANIC CHEMISTRY</b>	CO-1. Perform the Binary mixtures. CO-2. Preparation of organic compounds, their purifications and run

3.	<b>INORGANIC CHEMISTRY</b>	CO-1. Study the gravimetric and volumetric analysis of ores and alloy. CO-2. Prepare a various inorganic complexes and determine its % purity.
	<b>COURSE SEMESTER-III</b>	
1.	<b>MOLECULAR SPECTROSCOPY</b>	CO-1. Study <sup>1</sup> H NMR Spectroscopy: Chemical Shift, deshielding, correlation for protons bonded to carbon and other nuclei. CO-2. Study of <sup>13</sup> C NMR spectroscopy: FT- NMR, type of <sup>13</sup> C NMR spectra, proton decoupled off resonance, APT, INEPT, DEPT, Chemical shift, nuclear and hetero nuclear coupling constant CO-3. 2D NMR techniques: COSY, homo and hetero nuclear 2D resorts spectroscopy, NOESY and the applications CO-4. Study of mass spectrometry: Instrumentation, various methods of ionization, SIMS, FAB, MALDI. Different detectors rules of fragmentations of different functional groups.
2.	<b>BIO INORGANIC &amp; ORGANOMETALIC CHEMISTRY</b>	CO-1 To know the structure and bonding of important coordination compounds CO-2 To understand the magnetic properties of complexes and to know how magnetic moments can be employed for the interpretation of their structure CO-3 To get an overview about the stereochemistry of coordination compounds CO-4 To study the reaction mechanisms of metal complexes. CO-5 Enable the students to elucidate the structure of metal complexes using various spectroscopic methods CO-6 To get an idea about the basic coordination chemistry of Lanthanides and Actinides
3.	<b>REAGENTS AND TRANSFORMATIONS IN ORGANIC CHEMISTRY</b>	CO-1 To understand the basic concepts and mechanism in organic chemistry CO-2 To get an idea about the various kinetic and thermodynamic factors which control the organic reactions

		<p>CO-3 To know stereochemistry and various possible conformations of organic compounds and how it affects the reaction outcome</p> <p>CO-4 To be familiarize with the important photochemical reactions in Organic Chemistry</p>
4.	<b>SYNTHETIC ORGANIC CHEMISTRY</b>	<p>CO-1 To know the various methods employed for reactions like oxidation, reduction, carbocyclic and heterocyclic ring formation etc.</p> <p>CO-2 To get insights into novel reactions and reagents in organic synthesis</p> <p>CO-3 To know the utility of protecting group strategy in organic synthesis</p> <p>CO-4 To be familiarise the students with the basic principles of retro syntheses, biosynthesis and biomimetic synthesis</p>
	<b>COURSE SEMESTER-IV</b>	
1.	<b>INDUSTRIAL CATALYSIS</b>	<p>CO-1. Know the importance of chemical industry.</p> <p>CO-2. Classify various insecticides.</p> <p>CO-3. Study the nutritive aspects of food constituents.</p> <p>CO-4. Understand the characteristics of some food starches.</p> <p>CO-5. Study the manufacture of cement, dyes, Glass, Soap and Detergents by modern methods.</p>
2.	<b>ADVANCE TOPICS IN CHEMISTRY</b>	<p>CO-1 To get a brief idea about emerging branches in chemistry like supramolecular chemistry, nanochemistry, medicinal chemistry, polymer chemistry and its applications</p> <p>CO-2 To learn the principles of green chemistry and to know the various green protocols in organic synthesis</p> <p>CO-3 To study the important stereoselective transformations in organic synthesis</p> <p>CO-4 To know the basic aspects of natural product chemistry.</p> <p>CO-5 To get an overview about research process and to gain the ability to apply various research methods and techniques.</p>
3.	<b>INDUSTRIAL CATALYSIS</b>	<p>CO-1 To learn the different theories of reaction rates and factors affecting reaction rates</p>

		<p>CO-2 To have an idea about the different types of catalysis and their mechanisms</p> <p>CO-3 To study the chemistry of surfaces and different types of surface phenomena</p> <p>CO-4 To get an idea about the various techniques employed for the characterization of surfaces.</p> <p>CO-5 To know the general properties of colloids and macromolecules</p> <p>CO-6 To have an idea about the important aspects of photochemistry</p>
	<b>COURSE- PRACTICAL III &amp; IV</b>	
1.	<b>PHYSICAL CHEMISTRY</b>	CO- 1 Enable the students to determine the various physical properties using simple instrumental methods like polarimetry, refractometry etc.
2.	<b>ORGANIC CHEMISTRY</b>	<p>CO-1 To gain the skill to prepare organic compounds using greener protocols</p> <p>CO-2 Enable the students to prepare organic compounds via two step synthetic sequences</p>
3.	<b>INOGENIC CHEMISTRY</b>	CO-1 Enable the students to estimate the binary mixtures of metallic ions by volumetric and gravimetric methods

## M Sc Mathematics

### Programme Outcomes

- Inculcate critical thinking to carry out scientific investigation objectively without being biased with preconceived notions.
- Equip the student with skills to analyze problems, formulate an hypothesis, evaluate and validate results, and draw reasonable conclusions thereof.
- Prepare students for pursuing research or careers in industry in mathematical sciences and allied fields

- Imbibe effective scientific and/or technical communication in both oral and writing.
- Continue to acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in mathematical sciences.
- Create awareness to become an enlightened citizen with commitment to deliver one's responsibilities within the scope of bestowed rights and privileges.

### **Programme Specific Outcomes**

- Understanding of the fundamental axioms in mathematics and capability of developing ideas based on them.
- Prepare and motivate students for research studies in mathematics and related fields.
- Provide knowledge of a wide range of mathematical techniques and application of mathematical methods/tools in other scientific and engineering domains.
- Provide advanced knowledge on topics in pure mathematics, empowering the students to pursue higher degrees at reputed academic institutions.
- Solve problems in the advanced areas of numerical analysis, linear algebra, and real analysis.
- Good understanding of number theory which can be used in modern online cryptographic technologies.
- Nurture problem solving skills, thinking, creativity through assignments, project work.
- Assist students in preparing (personal guidance, books) for competitive exams e.g. NET, GATE, etc.

### **Course Outcomes**

#### **Semester 1**

##### **1. Algebra- I**

- Students will have a working knowledge of important mathematical concepts in abstract algebra such as definition of a group, order of a finite group and order of an element.
- Students will be knowledgeable of different types of subgroups such as normal subgroups, cyclic subgroups and understand the structure and characteristics of these subgroups.

- Students will be introduced to and have knowledge of many mathematical concepts studied in abstract mathematics such as permutation groups, factor groups and Abelian groups.
- Students will see and understand the connection and transition between previously studied mathematics and more advanced mathematics. The students will actively participate in the transition of important concepts such as homomorphisms & isomorphisms from discrete mathematics to advanced abstract mathematics.
- Students will gain experience and confidence in proving theorems. A blended teaching method will be used requiring the students to prove theorems give the student the experience, knowledge, and confidence to move forward in the study of mathematics.

## **2. Linear Algebra**

### **Students will be able to**

- Use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, orthogonality and diagonalization. (Computational and Algebraic Skills).
- Use visualization, spatial reasoning, as well as geometric properties and strategies to model, solve problems, and view solutions, especially in  $\mathbb{R}^2$  and  $\mathbb{R}^3$ , as well as conceptually extend these results to higher dimensions. (Geometric Skills).
- Use technology, where appropriate, to enhance and facilitate mathematical understanding, as well as an aid in solving problems and presenting solutions (Technological Skills).
- Communicate and understand mathematical statements, ideas and results, both verbally and in writing, with the correct use of mathematical definitions, terminology and symbolism (Communication Skills).
- Critically analyze and construct mathematical arguments that relate to the study of introductory linear algebra. (Proof and Reasoning).
- Work collaboratively with peers and instructors to acquire mathematical understanding and to formulate and solve problems and present solutions (Collaborative Skills).



### **3. Real Analysis- I**

#### **Students will be able to**

- Describe fundamental properties of the real numbers that lead to the formal development of real analysis.
- Comprehend regions arguments developing the theory underpinning real analysis.
- Demonstrate an understanding of limits and how that are used in sequences, series and differentiation.
- Construct rigorous mathematical proofs of basic results in real analysis.
- Appreciate how abstract ideas and regions methods in mathematical analysis can be applied to important practical problems.

### **4. Number Theory**

#### **Students will be able to**

- Prove results involving divisibility and greatest common divisors.
- Solve systems of linear congruences.
- Find integral solutions to specified linear Diophantine Equations.
- Apply Euler-Fermat's Theorem to prove relations involving prime numbers.
- Apply the Wilson's theorem.

### **5. Discrete mathematics**

#### **Students will be able to**

- Analyse and prove a selection theorems Boolean Algebra and Boolean Functions.
- Assess properties implied by the definitions order relations and lattices.
- Understand basic graph theory
- Know the theory of Computation and Finite Automata

## **SEMESTER 2**

### **1. Algebra- II**

#### **Students will be able to**

- Explain the fundamental concepts of field extensions and Galois theory and their role in modern mathematics and applied contexts.
- Demonstrate accurate and efficient use of field extensions and Galois theory.
- Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concepts from field extensions and Galois theory.
- Apply problem-solving using field extensions and Galois theory applied to diverse situations in physics, engineering and other mathematical contexts.

## **2. Real Analysis- II**

### **Students will be able to**

- Students will understand the fundamentals of measure theory and be acquainted with the proofs of the fundamental theorems underlying the theory of integration
- They will also have an understanding of how these underpin the use of mathematical concepts such as volume, area, and integration.
- They will develop a perspective on the broader impact of measure theory in ergodic theory and have the ability to pursue further studies in this and related area.
- Explain the concept of length, area, volume using Lebesgue's theory.
- Apply the general principles of measure theory and integration in such concrete subjects as the theory of probability or financial mathematics.

## **3. Topology**

### **Students will be able to**

- Understand terms, definitions and theorems related to topology.
- Demonstrate knowledge and understanding of concepts such as open and closed sets, interior, closure and boundary.
- Create new topological spaces by using subspace, product and quotient topologies.
- Use continuous functions and homeomorphisms to understand structure of topological spaces.
- Demonstrate knowledge and understanding of metric spaces.
- Apply theoretical concepts in topology to understand real world applications.

#### 4. ODE AND CALCULUS OF VARIATIONS

- Analyze real world scenarios to recognize when ordinary differential equations (ODEs) or systems of ODEs are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches, judge if the results are reasonable, and then interpret and clearly communicate the results.
- Recognize ODEs and system of ODEs concepts that are encountered in the real world, understand and be able to communicate the underlying mathematics involved to help another person gain insight into the situation.
- Work with ODEs and systems of ODEs in various situations and use correct mathematical terminology, notation, and symbolic processes in order to engage in work, study, and conversation on topics involving ODEs and systems of ODEs with colleagues in the field of mathematics, science or engineering.

#### 5. Operations research

##### **The students will be able to**

- formulate some real life problems into Linear programming problem.
- use the simplex method to find an optimal vector for the standard linear programming problem and the corresponding dual problem
- prove the optimality condition for feasible vectors for Linear programming problem and Dual Linear programming problem.
- find optimal solution of transportation problem and assignment problem
- learn the construction of networks.
- formulate and solution of linear programming model of two person zero sum game

#### Semester 3

##### 1. Functional Analysis

##### **Students will be able to**

- Understand the normed linear spaces, Banach space and Dual spaces  
2) Understand inner product spaces, orthogonality and Hilbert spaces.
- distinguish between finite and infinite dimensional spaces.
- apply linear operators in the formulation of differential and integral equations.

## **2. Complex Analysis**

### **Students will be able to**

- Perform basic algebraic manipulation with complex numbers.
- Understand the geometric interpretation of complex numbers.
- Know methods of finding the  $n$ th roots of complex numbers and the solutions of simple polynomial equations.
- Use analytical functions and conformal mappings.
- Compute definite integrals using residue calculus.
- Appreciate the existence of special functions and their use in a range of contexts.

## **3. Multi variable calculus**

### **Students will be able to**

- Understand the basic concepts and know the basic techniques of differential and integral calculus of functions of several variables.
- Apply the theory to calculate the gradients, directional derivatives, arc length of curves, area of surfaces, and volume of solids.
- Solve problems involving maxima and minima, line integral and surface integral, and vector calculus.
- Develop mathematical maturity to undertake higher level studies in mathematics and related fields.

## **4. PDE and Integral Equations**

### **Students will be able to**

- Apply a range of techniques to find solutions of standard Partial Differential Equations (PDE)
- Understand basic properties of standard PDE's.
- Demonstrate accurate and efficient use of Fourier analysis techniques and their applications in the theory of PDE's.
- Demonstrate capacity to model physical phenomena using PDE's (in particular using the heat and wave equations).

- Apply problem-solving using concepts and techniques from PDE's and Fourier analysis applied to diverse situations in physics, engineering, financial mathematics and in other mathematical contexts.

## **Semester 4**

### **1. Algebraic number theory (elective)**

#### **Students will be able to**

- define the key notions of algebraic number theory and outline their interrelation;
- calculate the most important number theoretical quantities introduced during the course;
- give an account of the fundamental theorems of the course and apply them in specific cases;
- outline important parts of the theory presented during the course, such as the deduction of the four-squares theorem from Minkowski's theorem and Kummer's proof of Fermat's great theorem for regular prime exponents;
- explain the concept of "geometry of numbers" according to Minkowski

### **2 Advanced functional analysis (elective)**

#### **Students will be able to**

- Understand central concepts from functional analysis, including the Hahn-Banach theorem, the open mapping and closed graph theorems.
- Understand the concept of dual spaces, weak convergence and the spectral theorem for compact self-adjoint operators.
- apply his or her knowledge of functional analysis to solve mathematical problems.

### **3. Differential geometry (elective)**

#### **Students will be able to**

- define the equivalence of two curves.
- find the derivative map of an isometry.
- analyse the equivalence of two curves by applying some theorems.

- defines surfaces and their properties
- express definition and parametrization of surfaces.
- express tangent spaces of surfaces.
- explain differential maps between surfaces and find derivatives of such maps.
- integrate differential forms on surfaces.
- list topological aspects of surfaces.
- define the concept of manifolds.
- give examples of manifolds and investigate their properties.

#### **4.Advanced operations research (elective)**

##### **Students will be able to**

- Set up decision models and use some solution methods for nonlinear optimization problems.
- analyse the general nonlinear programming problems.
- formulate the nonlinear programming models.
- use some solution methods for solving the nonlinear optimization problems.
- explain the lagrange multipliers.
- show the Kuhn-Tucker optimality conditions.
- solve multi-level decision problems using dynamic programming method.
- explain fundamentals of dynamic programming.
- use deterministic and stochastic dynamic programming approaches.
- Understand geometric programming problems.

## M Sc Microbiology

students are able to:

- Instill the intellectual skills to analyze the molecules using advance biophysical techniques such as HPLC, GC, AAS, PCR etc.
- Perform the quantitative/ qualitative analysis of Biomolecules and understand various biochemical pathways
- Acquire knowledge and understanding the concepts of Microbial genetics, Molecular biology, Immunology, Enzymology.
- Explore the scientific literature effectively and use computational tools such as bio-statistical and bioinformatics
- Implement the knowledge in industry with regard to scale up, production, scale down and quality control of the various microbial products
- Conduct the basic research related to industry-environmental issues and use of agricultural

### **PAPER 1: GENERAL BIOCHEMISTRY AND METABOLISM**

make the students knowledgeable on the various biological molecules their importance

- study the classification and structural properties of various biological molecules
- acquire an overall knowledge on enzymes and their kinetics
- provide knowledge on metabolic pathways and their biochemical importance

### **PAPER 2: BIOPHYSICS AND BIOINSTRUMENTATION**

Understand the principle and application of gas liquid chromatography, HPLC, and PCR

- Understand the principle and application of electrophoresis
- Realize the importance of UV-Visible, MALDI-TOF
- Understand the importance of microscopy, pH meter

### **PAPER 3: AGRICULTURAL MICROBIOLOGY AND PLANT PATHOLOGY**

- Understand the biogeochemical cycle
- understand the role of microbes in agriculture
- know the importance of biofertilizers and biopesticides
- study about plant infection process and control measures

### **PAPER 4: ENVIRONMENTAL AND SANITATION MICROBIOLOGY**

- Understand on soil characteristics and biochemical cycling
- Know the microbial analysis of drinking water and aeromicrobiology

Know on the different aspects of waste management and sewage treatment system

Acquire knowledge on bioremediation and bioleaching

#### **PAPER 5: PRINCIPLES OF GENETICS**

Understand concept of genes and chromosomes

understand about genes and mechanisms of mutation

understand about linkage and crossing over study the gene transfer mechanisms

#### **PAPER 6: FOOD AND DIARY MICROBIOLOGY**

study about the food spoilage and preservation

understand fermentation technologies in food processing industry

Acquire knowledge in diary microbiology

understand about the food quality analysis and the role of government organisation involved in food quality control

#### **PAPER 7: INDUSTRIAL MICROBIOLOGY**

understand about screening methods for industrial microbes

Acquire knowledge in the production of various industrial products

know about the fermentation process

Know various downstream processing

#### **PAPER 8: IMMUNOLOGY**

Understand basics of immunology

Concept related to cells and organs related to immune system

Immune response and immune mechanisms

Understand the antigen antibody reactions

Know about principles of hypersensitivity

#### **PAPER 9: MEDICAL MICROBIOLOGY**

Understand the role of pathogen in causing infectious disease on humans

Various bacterial diseases ,their causitive agents ,mode of infection,lab diagnosis ,treatment ,prophylaxis

Various viral diseases ,their causitive agents,mode of infection,lab diagnosis,treatment, prophylaxis

Various fungal diseases , their causitive agent ,mode of infection ,lab diagnosis,treatment , prophylaxis

#### **PAPER 10: MOLECULAR BIOLOGY**

Understand detailed mechanism of replication ,transcription,translation

Know various types of mutagenesis

Get through knowledge on oncogenes and tumor supressor gene

Better understanding of gene expression



### **PAPER 11: CELL BIOLOGY**

Understand about cell and cell theory  
know about cell organells  
Understand about cell cycle

### **PAPER 12:BIOSTATISTICS AND BIOINFORMATICS**

Different computational methods used in basic biostatistics  
Software usedin bioinformatics  
Biological databases for protein and nucleic acid

### **PAPER13: GENETIC ENGINEERING**

Understand the concept and methods in gengtic engineering  
Acquire knowledge on application of genetic engineering  
Understand about the construction of recombinant DNA  
Basics ideas on cloning vehicle

## **M.COM**

### **AIM OF THE PROGRAMME**

The broad aim of the Programme is to provide awareness to the learners regarding the developments in the field of Business, Commerce, Industry and Management and equip them to develop necessary analytical and managerial skills so as to cope up with the challenges posed by industry and environment, both national and global.

### **PROGRAMME OUTCOMES**

M.Com degree programme offered by the Department of commerce, is outcome based and the outcomes expected are as follows:

- PO1 Enhancing the horizon of knowledge so as to enable the learners to carry out qualitative research and pursue academic or professional careers.
- PO2 Develop, problems analysis skills and applying the same in real life situation.
- PO3 Developing effective communication skills and ability to work in teams by strengthening group dynamics

PO4 Understanding the role and applicability of knowledge acquired in the context of society, environment and sustainable development sticking on to the ethics and values.

PO5 Using research knowledge and aptitude acquired in the course of study for solving socially relevant problems

PO6 Fostering ability to engage in lifelong learning, demonstrating empathetic social concern, contributing to the development of nation, by making sure of awareness gained on various issues.

### **PROGRAMME SPECIFIC OUTCOMES**

PSO 1: Develop the skills of analysis and capability of making business decisions

PSO 2: Develop skills in the preparation of accounting statements

PSO 3: Generate practical knowledge of stock market and e filing and filing of return

PSO 4: Understand marketing practices in service sector.

PSO 5: Develop the skills in application of research methods.

PSO 6: Understand ethical issues and good governance practices.

PSO7: Facilitating learner to pursue career in professional areas of commerce and management such as taxation, financial services, consultancy etc.

### **COURSE OUTCOME**

#### **SEMESTER– I**

SL NO .	COURSE CODE	COURSE TITLE	OUTCOMES
1	MCM1C01	Business Environment & Policy	To familiarize students with the concepts of macro-economic in which a Business organization operates  To give an idea about the policies of the

			government and assess their impact on business.
2	MCM1C0 2	Corporate Governance & Business Ethics	To familiarize the students with the knowledge of corporate ethics  To enable the students to understand the emerging trends in good governance practices.  To create corporate financial reports in the global in the global and Indian context.
3	MCM1C0 3	Quantitative Techniques for Business Decisions	To acquaint students with important quantitative techniques, which enable sound business decision making  To make students learn the process of applying appropriate quantitative techniques for validating findings and interpreting the result
4	MCM1C0 4	Management Theory and Organizational Behavior	To help the students to understand the conceptual frame work of management and organizational behavior  To understand the managerial applicability of the concepts.
5	MCM1C0 5	Advanced Management Accounting	To enable students to understand and apply tools, techniques, and concept in managerial decision making process  To inculcate analytical skills in interpreting and diagnosing business problems
<b>Ability Enhancement Course</b>			
6	MCM1A0 4	NET Coaching	To generate awareness among students about various competitive examinations  To motivate students to take part in NET examination.

## SEMESTER– II

SL NO.	COURSE CODE	COURSE TITLE	OUTOME
1	MCM 2C06	Advanced Corporate Accounting	To provide knowledge and skills in the theory and practice of Corporate Financial Accounting To provide insight into some of the important of accounting

			To enable problem solving abilities among students in matters of various corporate situations such as consolidation of group information, corporate restructuring and liquidation
2	MCM 2C07	Advanced Strategic Management	To understand the various strategies adopted in business development  To familiarize the advanced management strategies and its relevance in changing environment
3	MCM 2C08	Strategic Cost Accounting	To enable the students to know the applications of Cost accounting tools, Techniques and concepts in managerial decision-making process. To provide students adequate knowledge of cost management and control techniques and to enable them to apply these for managing business
4	MCM 2C09	International Business	To understand different aspects of international business  To aware about international agreement and mode of international business operations
5	MCM 2C10	Management Science	To familiarize students with concepts of management science and tools supporting decision making  To enable students to apply Management science techniques in appropriate decision situations
Professional Competency Course (PCC)			
6	MCM2 A04	Spread Sheet Application	To gain an understanding of how managers use spread sheet analysis to formulate and solve business problems and to support managerial decision making.  To become familiar with the processes needed to develop, report, and analyses business

### SEMESTER– III

SL NO.	COURSE CODE	COURSE TITLE	OUTCOMES
1	MCM 3C11	Financial Management	<p>To acquaint the students with the basic analytical techniques and methods of financial management of business organization.</p> <p>To provide the students the exposure to certain advanced analytical techniques that are used for taking financial policy decisions.</p>
2	MCM 3C12	Income Tax Law, Practice And Tax Planning I	To enable students to understand computation of income under various heads, taxable income of various entities, tax planning and procedure of assessment.
3	MCM 3C13	Research Methodology	<p>To acquaint students with process and methodology of research</p> <p>To enable students to identify research problems, collect and analyses data and present results</p>
4	MCM 3EF01	Investment Management	To establish a conceptual framework for the study of security analysis and portfolio management. This course will provide the students the ability to understand and utilize the skill of optimizing returns
5	MCM 3EF02	Financial Markets And Institutions	<p>To provide the students a sound information and knowledge of broad framework of financial markets and institutions.</p> <p>To impart the students an understanding of the inter-linkages and regulatory framework within which the system operates in India</p>

### SEMESTER –IV

SL NO.	COURSE CODE	COURSE TITLE	OUTCOMES
1	MCM 4C14	Financial Derivatives And Risk Management	To make the students efficient in the area of derivatives, by giving them the knowledge of basics in options, futures, swaps etc.
2	MCM 4C15	Income Tax: Law, Practice And Tax Planning Ii	To acquaint the students with theoretical and practical knowledge of assessment and tax planning of different assesses. To familiarize the students with major and latest provisions of the India tax laws and related judicial pronouncements pertaining to various assesses with a view to derive maximum possible tax benefits admissible under the law.
3	MCM 4EF03	International Finance	To understand the concept and significance of international finance To understand the international financial markets and exchange theories To get an idea about foreign exchange exposure and risk management
4	MCM 4EF04	Advanced Strategic Financial Management	To build an understanding among students about the concepts, vital tools and techniques used for financial decision making by a business firm.
5	MCM4PV01	Project Work & Comprehensive Viva Voce	To offer advanced learning those who are already familiar with them. To enhance the creative thinking skills and motivate to innovate new product designs and possibilities for projects. To build on their research skills and deepen their learning of applied content beyond facts or memorization.

## M.A. JMC

After successful completion of two year degree program in Journalism and mass communication, a Student should be able to;

- **PROGRAMME OUTCOMES**

PO-1 Demonstrate knowledge of theoretical and empirical bases underpinning the construction, implementation and interpretation of communication theories, practical understanding of various aspects of mass communication.

PO-2 Demonstrate skills required to participate in, design and implement research projects and discuss issues and ideas related to the field of journalism and mass communication.

PO-3. Develop skills and ability to adopt online tools, modules, interfaces to build journalism  
Capital, search relevant information and operate various software.

PO-4 Analyse critically, independently and creatively identifies and formulates cases, issues,  
Solutions related to journalism and mass communication.

PO-5. Display active listening in form of active listening while handling sources, employee etc. and be able to interpret the verbal and non-verbal communication cues and interpersonal skills.

PO-6. Develop range of leadership skills and exhibit imitiveness while working in collaboration and demonstrate ability to work in team with self-awareness of personal strengths and limitation.

- **PROGRAMME SPECIFIC OUTCOMES**

PSO-1 Assess global issues from different perspectives and apply them in the field of journalism and mass communication.

PSO-2 Demonstrate highest level of ethical conduct; discuss professionalism and professional responsibility when involved in news gathering, advertising and other activities at the workplace.

PSO-3 Discuss and demonstrated professional skills which will lead to employability and exhibit capability to pursue alternate career paths such as setting up their own production houses, newspapers, advertising agencies, doctoral training, post-doctoral research and advanced training certifications

PSO-4 Students shall develop ability and inquisitiveness to continuously update themselves with respect to the recent trends in field of journalism and mass communication.

PSO-5 Develop and demonstrated empathetic and compassionate feelings so that they are able to deal with sources, subjects and co-workers.

• **COURSE OUTCOMES**

SL NO	COURSE-SEMESTER I	OUTCOMES
1.	INTRODUCTION TO MASS COMMUNICATION	<p>CO-1 Familiarise students with the basic concepts of communication, specifically mass communication as a human/social/cultural process.</p> <p>CO-2. To introduce communication models as a method for studying communication in a disciplinary framework.</p> <p>CO-3. To present mass media system as a cultural institution and an industry, with special reference to the Indian context.</p> <p>CO-4. To acquaint students with key theories, theoreticians and schools of thought in communication, their historical evolution and influence on various social domains.</p>
2.	MASS MEDIA HISTORY	<p>CO-1. Understand the transition of press in the world.</p> <p>CO-2. Trace the growth of media in India and its</p>



		<p>engagement with politics and social change at the different points in history.</p> <p>CO-3. Recognise the outcomes of different commissions, Acts and amendments regarding media.</p> <p>CO-4. Critically evaluate the functioning of Indian film industry and film certifications</p>
3.	NEWS EDITING	<p>CO-1. Understand the role of editors and the functioning of the editorial section and the basic ethical issues confronting editors.</p> <p>CO-2. Critically analyse copies to ensure accuracy and objectivity.</p> <p>CO-3. Use correct grammar and eliminate items in poor taste in the copy.</p> <p>CO-4. Write clear and accurate headlines, decks and captions.</p> <p>CO-5. Design basic news pages.</p>
4.	NEWS REPORTING	<p>CO-1. Recognise news and report it professionally following the latest trends in the field and ethical considerations in place.</p> <p>CO-2. Analyse the language of news and practice news writing.</p> <p>CO-3. Critically evaluate news management systems and related journalistic practices.</p>
5	LAB JOURNAL PRODUCTION1	<p>CO-1. To type in English and Malayalam and to paginate the content of print media like newspapers and magazines.</p> <p>CO-2. To do essential graphic design for all types of media</p> <p>CO-3. To critically evaluate the aesthetics of content visualisation and colour management of</p>

		various media.
	<b>COURSE –SEMESTER II</b>	
1.	THEMES, THEORIES AND ISSUES IN COMMUNICATION	<p>CO-1 Recognise the critical themes and issues in globalised communication practices and their impact on the society at large.</p> <p>CO-2 Critically evaluates the functioning of media conglomerates in the world and its impact on regional media practices and consumption.</p> <p>CO-3 Analyse the functioning of Indian media in a globalized environment.</p>
2.	PUBLIC RELATIONS	<p>CO-1 To understand the role and scope of PR in management, its various tools and the emerging importance of the discipline in varying areas. •</p> <p>CO-2 To know the evolution of Corporate Communication and its expanded role in organizational and marketing communication</p>
3.	ADVERTISING	<p>CO-1 Understand the scope of advertising from traditional print, electronic, and outdoor campaigns; to online and social media marketing promotions.</p> <p>CO-2 Recognize the societal impact of advertising and the need for ethical practitioners.</p> <p>CO-3 Perform a market segmentation analysis, identify the organization's target market/audience and define the consumer behaviour of each segment.</p> <p>CO-4 Enable students to participate in the development of creative solutions to address advertising and marketing communications challenges.</p>
4.	MEDIA LAWS	<p>CO-1 Have a thorough understanding of the constitutional provisions of media and communication.</p> <p>CO-2 Understand the rules and regulations in relation to media and communication profession.</p> <p>CO-3 Have discourses on media and communication ethics.</p>

5	LAB JOURNAL PRODUCTION2	CO-1. Develop or improve skills in contemporary videography and photography technology and operation of cameras and production equipment. CO-2. Achieve critical appreciation skills for the aesthetics of sound and image production. CO-3. Improve literacy in the visual language and achieve skills in digital media production. CO-4. Gain a greater understanding of storytelling in narrative and non-narrative visual productions.
	<b>COURSE SEMESTER-III</b>	
1.	DEVELOPMENT COMMUNICATION	CO-1. Recognise key concepts, approaches and action plans in the field of development communication in the global and national scenario. CO-2. Identify the potential of various communication methods for social change. CO-3. Critically evaluate the communication practices implanted by various agencies for development and social change.  CO-4. To present development communication policies and action plans in various sectors in India.
2.	RADIO, TELEVISION AND FILM PRODUCTION	CO-1. To familiarise the basic concepts in broadcast media and related technology. CO-2. To recognise and engage with various genres of radio and television programmes. CO-3. To familiarise students with the process, work flow and methods of radio and television production CO-4. To impart training in producing various radio and television programmes
3.	COMMUNICATION RESEARCH	CO-1. Recognise the key concepts and methods in communication research ••• CO-2. Design research work scientifically using various methodological frameworks CO-3. Apply theories and theoretical framework in their research work CO-4. Analyse data and arrive at conclusions

		independently and scientifically report research findings in the form of research articles and theses.
4	INTERNATIONAL COMMUNICATION	CO-1. Understand key concepts and areas of the discipline global communication to engage in the discourses related to global communication. CO-2. Recognise the critical themes and issues in globalised communication practices and their impact on the society at large. CO-3. Critically evaluate the functioning of media conglomerates in the world and its impact on regional media practices and consumption CO-4. Analyse the functioning of Indian media in a globalized environment
5	LAB JOURNAL PRODUCTION <sup>3</sup>	CO-1 Understand and explain key concepts of photography theory and explain how photographs communicate visually in a story. CO-2 Learn to analyze and critique photographs and gain a better understanding of camera techniques CO-3 Visually tell a news story.
	<b>COURSE SEMESTER-IV</b>	
1	FEATURE WRITING AND MAGAZINE EDITING	CO-1. Understand the role of editors and the functioning of the editorial section and the basic ethical issues confronting editors. • Write clear and accurate headlines, decks and captions. • Design basic news pages. CO-2. Critically analyse copies to ensure accuracy and objectivity CO-3. Use correct grammar and eliminate items in poor taste in the copy. CO-4. Write clear and accurate headlines, decks and captions. CO-5 Design basic news and magazine pages.
2	FILM STUDIES	CO-1. To introduce and explore basic concepts in film analysis and interpretation and articulate the historical, cultural, and material contexts that underpins concepts such as genre, auteur,

		<p>spectator, and audience.</p> <p>CO-2. Explain the wider historical, cultural and material processes that involved in filmmaking from time to time</p> <p>CO-3. Present current theories of cinema as text, image and mediated process</p> <p>CO-4. Offer an overview of the stylistic traits peculiar to different movements and traditions of film in a comparative context.</p>
3	VISUAL MEDIA PRODUCTION	<p>CO-1. To provide insight into the historical evolution of and contemporary trends in visual media productions.</p> <p>CO-2. To offer theoretical knowledge and practical training in visual media productions.</p> <p>CO-3. To equip the students to approach visual media productions critically</p>
4	DISSERTATION/VIVA - VOCE/INTERNSHIP	<p>CO-1. Do research in the field of mass communication and journalism.</p> <p>CO-2. Collect quantitative and qualitative data and analyse them critically to contribute innovative output to the domain on knowledge</p> <p>CO-3. Report research output in the form of theses and articles and present them and defend the findings and arguments in academic fashion</p>
5	LAB JOURNAL PRODUCTION4	<p>CO-1. Understand the trajectories in the development of documentary films as a communication Form.</p> <p>CO-2. Recognise concepts, terms, categories and key elements in documentary filmmaking.</p> <p>CO-3. Understand the process of documentary filmmaking from ideation to final production</p> <p>CO-4. Able to critically analyse documentary films</p>