Programme Outcome – Undergraduate Programmes

After completion of the undergraduate programme the participants should have achieved the following outcomes:

1. The participants should have the basic knowledge of concepts in various subjects being covered as part of their undergraduate programme.

2. Students should have basic familiarity of the methods, approaches or theories used in acquiring and interpreting information relevant to their disciplines.

3. Students should develop effective oral and written communication skills and develop competency in presenting information they have acquired.

4. Students should develop proficiency in research and analytical skills.

5. Students should attain proficiency in basic computer operations.

6. The participants should become responsible citizens with human values.

Programme Outcome – Post Graduation

1. The participants should have in depth knowledge of the subjects they learn as part of their post graduate programme.

2. The students should acquire the ability to apply the methods, approaches or theories in various relevant situations.

3. Students should acquire expertise in research methodology and analytical skills.

4. Students should develop effective oral and written communication skills and develop competency to persuade their listeners.

B A DEVELOPMENT ECONOMICS

Program specific outcome

The principal aims of objectives of the BA Economics programme are:

1. To provide students a well-founded education in Development Economics;
2. To provide structured curricula which support the academic development of students;
3. To provide and adapt curricula that prepare our graduates for employment and further study as economists;
4. To provide the students with the opportunity to pursue courses that emphasize quantitative and theoretical aspects of Development Economics;
5. To provide students with the opportunity to focus on applied and policy issues in Economics;
6. To provide programmers that allow the students to choose from a wide range of economic specialization;
7. To provide a well-resourced learning environment for Economics.

Semester	Course	Outcomes
I	CORE 1: MICROECONOMICS – I (1B01- ECO)	• To deal with basic theories and concepts that the mainstream economic literature • To understand the cost and production analysis. • To know about different market equilibrium and respective market • To give basic knowledge about consumer choices
II	CORE 2: MICROECONOMICS – II (2B02- ECO)	• To give basic knowledge about different market structure • To understand economic decision making in different markets • To brief about factor market • To give an insight about social welfare and welfare economics

III	CORE 3:MACROECONOMICS – I (3B03- ECO)	• To understand systems facts and the latest theoretical developments in Macro Economics. • To Analysis of Classical Macroeconomic Model • To sum up Keynesian Macroeconomic Model • To evaluate Consumption and Investment Behaviour of Households and Firms
III	CORE 4: INTERNATIONAL ECONOMICS (3B04-ECO)	• To deals with the economic and financial interdependence among nations. • To understand BOP • To study BOT • To get familiar with TOT • To learn Foreign Exchange and international financial system
IV	CORE 5: MACROECONOMICS – II (4B05- ECO)	• To get familiarise with theories of money flow • To sum up ISLM and other relevant macroeconomics models • To introduce trade cycles and other macroeconomics aspects such as employment, inflation and so on
IV	CORE 6: ENVIRONMENTAL ECONOMICS (4B06-ECO)	• To maintain economic growth and development of Indian economy • To ensure environmental protection and pollution control measures. • To teach economic aspects of environment and related theories • To enhance knowledge about role of environment in economic planning
V	CORE 7: BASIC TOOLS FOR ECONOMIC ANALYSIS – I (5B07-ECO)	• Understanding in quantitative techniques with in economics • Role of statistics in economics • To introduce Elementary Mathematics • To sum up Elementary set theory and description of

		• data
		• to understand basic probability
V	CORE 8: ALTERNATIVE ECONOMICS (5B08-ECO)	• To introduce students of economics to a few alternative approaches to neo-classical economics. • To teach methodological departures and the possibilities to think differently. • To introduce new branches of economics
V	CORE 9: RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS (5B09-ECO)	• Explain the main concerns of social science disciplines. • Articulate the basic terminology and theories prevalent across various disciplines. • Understand qualitative and quantitative models within the social sciences, especially economics. • Learn to apply the methods and theories of social sciences to contemporary issues. • Critically read popular and periodical literature from a social science perspective.
V	CORE 10:Economics of Development and Planning -I(5B10DEV ECO)	• To create general understanding among students about the theories of development and growth models so as to explain the development or growth process of various countries or states. • To give an idea about how they are different by giving empirical details of various indicators of growth and development in India in comparison to other parts of the world. • To understand various developmental issues faced by an economy and place it within the developmental debate.
V	CORE 11: ECONOMICS OF BANKING &FINANCE (5B11-ECO)	• To understand evolution of banking. • To identify structure and functions of banking. • To maintain awareness of banking sector. • To introduce the students to the various facts of

		banking sector.
VI	CORE 12: BASIC TOOLS FOR ECONOMIC ANALYSIS – II (6B12-ECO)	• To This course is expected to provide students with an elementary introduction to statistical tools and mathematical concepts that are used in the study of Economics in UG level. • To introduce essential elementary topics in Statistics and mathematics. • To develop skills in applying in statistical techniques and mathematical concepts those are indispensable for the in-depth study of theoretical as well as empirical economics.
VI	Core 13: Economics of Development and Planning – II (6B13-DEV ECO)	• To introduce famous theories growth and development • To understand latest aspects and challenges of growth and development issues of the world.
VI	CORE 14: PUBLIC ECONOMICS (6B14-ECO)	• To find Nature and scope of public economics • To analyze meaning and importance of federalism • To covers theories of public economics and discusses about Indian public finance. • To look at how public sector behaviour is shaped and discusses about public choice. • To understand the nature of government intervention and its implications for allocation, distribution and stabilization. • To provide an understanding of the basic issues relating to public revenue, expenditure, debt management, budget preparation and centre state financial relations in India. • To make them capable of understanding the financial activities and policies of the government.
VI	CORE 15: BASIC ECONOMETRIC ANALYSIS (6B15-	• To showcase the increased emphasis on the development and use of econometric techniques for the analysis of economic problems.

	ECO)	• The study of Econometrics has become an essential part of every undergraduate course in Economics, and it is not an exaggeration to say that it is also an essential part of every economist's training.
		• Mastery over econometric tools helps the practitioner understand the problem at hand in its different dimensions.
		• To enhance the analytical skill of students thereby they will attract wider demand in professional fields.
VI	CORE 16: PROJECT/COURSE WORK (6BP - ECO)	• To create a research aptitude
		• To motivate students to enquire into recent relevant economic issues and find solutions
		• To generate new knowledge and updating existing knowledge from the day to day experience is one of the aims of higher education.
		• To provide opportunity to apply the theoretical knowledge that they acquired in class room environment to the real world situations by taking up any issue as a project that requires review, explanation or solution.
		• To enable the student to approach socio-economic issues in a theoretical perspective. The student is encouraged to collect and organize the existing information on the topic and arrive at his/her own logical conclusion by following a methodology and applying the analytical tool.

Bachelor of Business Administration

Programme Specific Outcome

1. To equip students with knowledge and skills to assume management Positions in a wide range of organizations.
2. To give strong foundations to conceptual skills, quantitative skills, organizational skills, accounting skills, data analytical skills in the students
3. To help them understand how organizations work, how they are managed and how they interact with local, national and international environments.
4. To give a strong base for students keenly interested in higher studies in the management stream
5. To ensure employability and career excellence and mould socially responsible team of executives.

Semester	Course	Outcomes
I	1BO1BBA : PRINCIPLES AND PRACTICE OF MANAGEMENT	• To understand the principles and practices of General Management. • To know the process of business management and its functions and • To familiarize the students with current management practices.
I	1CO1BBA : BUSINESS STATISTICS	• To acquaint the students the basic statistical tools which have application in business and economic situations. • To familiarize the students with basic statistical tools used to summarise and analyse quantitative information for decision making
I	1CO2BBA : BUSINESS ECONOMICS	• To use economic reasoning to problems of business. • To apply economic analysis in the formulation of business policies.

		• To use economic reasoning to problems of business.
		• To acquaint the students about different market structures
II	2BO2 BBA: BUSINESS ENVIRONMENT	• To give the students and exposure to the dynamics of business environment
		• To enable the students to analyse business priorities in the changing environmental conditions
II	2B03BBA : BUSINESS COMMUNICATION	• To understand the concept, process and importance of communication.
		• To gain knowledge of media of communication
		• To develop skills of effective communication - both written and oral
		• To help students to acquaint with application of communication skills in organizations
II	2C03BBA : QUANTITATIVE TECHNIQUESFOR BUSINESS DECISIONS	• To acquaint the students the basic quantitative tools which have application in business and economic situations.
		• To familiarize the students with basic quantitative tools used to summarise and analyse quantitative information for decision making
III	3A11COM/BBA : IT in Business	• To acquaint with the Information technology infrastructure
		• To understand the concept and application of management
		• information system
		• To understand the scope and key issues involved in managing

		• electronic commerce initiatives
		• To enable the optimum utilization of internet
III	3A12COM/ BBA : NUMERICAL SKILLS	• To understand basic concepts in mathematics which are applied in the managerial decision making
		• To ensure that the budding managers are comfortable with numerical skills
III	3B04 BBA(Core IV) : FINANCIAL ACCOUNTING	• To provide knowledge about accounting principles and their applications in different business situations.
		• To ensure that the students are confident with basic accounting problems.
III	3B05 BBA(CoreV) : OPERATIONS MANAGEMENT	• To get the students acquainted with the design aspects of operations and materials management
		• To develop relevant skill in operations management
III	3C04 BBA: LEGAL ASPECTS OF BUSINESS	• Meaning of contracts and its elements
		• Understanding Sales of Goods Act
		• Basic understanding of the Company's Act
		• Ideas about power of companies, cyber law etc
III	3BO6BBA(Core VI) : Managerial skill Development Course (MSDC)	• To enable the students to understand various budget proposals and its impact on the business sector
		• To understand the economic scenario of the nation
IV	4A13COM/BBA : ENTREPRENEURSHIP DEVELOPMENT& PROJECT MANAGEMENT	• To introduce the concept of Entrepreneurship
		• To introduce the basic concept of Project Management

		• To introduce technical and feasibility analysis • To Introduce project execution techniques
IV	4A14COM/BBA-BUSINESS ETHICS AND CSR	• To ensure that students and familiarized with the importance of CSR • To ensure the importance of value generation in business
IV	4B07 BBA(Core VII) – MARKETINGMANAGEMENT	• To understand the concepts and principles of marketing • To understand the marketing mix elements in detail • To understand various media of advertising • To enlighten the students about different sales promotion techniques
IV	4B08 BBA(CoreVIII) : CORPORATE ACCOUNTING	• To ensure that students get familiarized with company accounts • To ensure that students become comfortable with amalgamation, acquisition and reconstruction
IV	4B09 BBA(Core IX): FINANCIAL MANAGEMENT	• To enable the students apply latest financial management skills • To ensure that students get familiarized with financial management theories and practice
IV	4CO5BBA : BUSINESS RESEARCHMETHODS	• To enable students for acquiring basic knowledge in business research methods • To develop basic skills in students to conduct survey researches and case studies • To equip the students to develop a data collection tool • To enlighten the students about the format of a research report

V	5B11 BBA(Core XI) : COST ACCOUNTING	• Basic concepts of Cost accounting • To introduce various cost aspects – Material, labour& Overheads. • To Introduce the various methods of costing • Process costing and Contract costing.
V	5B12 BBA(Core XII) : HUMAN RESOURCEMANAGEMENT	• To impart the people skill among students • To ensure that students are comfortable with basis HR theories practice
V	5B13 BBA(Core XIII): BANKING THEORY, LAWAND PRACTICE	• Introduction to Banking system • Familiarize various types of deposits • Practical steps in opening accounts • Familiarize various negotiable instruments
V	5B14BBA (Core XIV) : ORGANISATIONAL BEHAVIOUR	• To familiarize the students with the basic concepts of the organizational behaviour • To throw light on the individual determinants of behaviour • To familiarize the students with the process of group dynamics • To understand organisational change and development
V	5B15 BBA(Core XV) : RETAIL MANAGEMENT	• To ensure that students get familiarized with the latest trends in retailing • To make sure that students get acquainted with the modern retail exposures.
V	5DO1 BBA(Open): FINANCIAL SYSTEM AND SERVICES	• To make sure that students are very comfortable with Indian Financial System and Services • To familiarise with the scope and depth of Indian Financial System and Services.
VI	6B16 BBA(Core XVI) : STRATEGIC MANAGEMENT	• To make students cope with the complexities of Indian business

		environment
		• Learn the applicability strategies in life and business
VI	6B17 BBA(Core XVII) : CAPITAL MARKET AND INVESTMENTMANAGEMENT	• To throw light on various aspects of stock market operations
		• To familiarize the students on fundamental analysis of a share
		• To understand various techniques of technical analysis
		• To understand various avenues of investment
VI	6B18BBA (Core XVIII) : INTERNATIONAL BUSINESS	• Introduction to International Business
		• Theories of International trade
		• International Financial environment
		• Foreign trade promotions and organizations in India
VI	6B19 BBA(Core XIX) : EVENTMANAGEMENT	• Learn the basics of event management
		• Learn the trends in the event industry
VI	6B20 BBA(Core XX) : MANAGEMENT ACCOUNTING	• Introduction Management Accounting
		• Analysis of interpretation of financial statements
		• Familiarize the concept of Marginal costing
		• Familiarize the concept of standard costing
VI	6B21BBA(Core XXI) : PLACEMENT TRAINING & PROJECT REPORT	• To practically understand Research Process.
		• To gain experience and confidence in carrying out a research
		• To acquire the quality to collect data, analyze and interpret.
		• To gain experience in writing research reports.

BSc COMPUTER SCIENCE

Programme specific outcomes

1. Understand the concepts of Hardware, System Software and Application Software.
2. Understand the concepts of Networks and Distributed Computing.
3. Design, develop, implement and test software systems to meet the given specifications, following the principles of Software Engineering.
4. Understand the concepts of emerging trends in Computer Science and Applications.

   Measuring Method: Examination, Project Evaluation, Course Viva, Lab Performance.

Semester	Course	Outcome
I	1B01CSC Introduction to Computers & Programming Languages	• To know the working principle of a computer. • To analyze the problem and write algorithm and flowchart. • To impart skills to enable students to use digital knowledge resources in learning.
II	2B02CSC Advanced Programming in C	• To develop c programs using advanced constructs. • To design algorithm for solving a programming problems. • Develop skill in programming.
III	3A11CSC Programming with C++	• Introduce concepts such as classes and objects. • Define and use classes and objects using C++ language. • Introduce OOPs concepts such as inheritance and polymorphism and their implementation

III	3A12CSC Digital Electronics	• To introduce student to basic concepts of digital logic • To introduce students to the design of basic logic circuits • To introduce students to some commonly used combinational and sequential circuits
III	3B04CSC Data Structure	• To introduce the concept of analysis of algorithms and ability to compare algorithms based on • Time and space complexity. • To familiarize with selected linear and nonlinear data structures.
IV	4A13CSC Database Management System	• Introduce the fundaments of Data Base Management System. • Skill in designing database. • Familiarization of different DBMS models.
IV	4A14CSC Operating System	• Familiarize with basics of design of operating systems • Introduce basic working process of operating systems. • To understand the importance process and scheduling.
IV	4B05CSC C# and .NET Programming	• To expose students to current trends and styles in programming • To familiarize simple, modern, general-purpose, object-oriented programming language.
V	5B08CSC Software Engineering	• Understand the basic processes in software Development life cycle. • Familiarize with different models and their significance. • Approach software development in a

		systematic way.
V	5B09CSC Web Technology	• To enable students to program for the World Wide Web using HTML, JavaScript, PHP,MSQL • To impart basic knowledge in relational databases, SQL and , Client-server model. • To create static and dynamic web pages PHP and My SQL.
V	5B10CSC Java Programming	• To review Object Oriented Programming concepts. • To learn concept of Object Oriented Programming using Java • To develop skill in java programming.
V	5B11CSC Linux Administration	• Introduce Linux working environment • Understand how install and configure Linux • Learn how to write shell scripts
VI	6B13CSC System Software	• Introduce formal language processing activities. • Basic idea of assembly language programming and role of assembler. • Insight into Design of assemblers and macro processors.
VI	6B14CSC Data Communication & Networks	• To understand state-of-the-art in network protocols, architectures and application. • To acquire knowledge about different computer networks. • To understand the use of layer architecture for networking systems.
VI	6B15CSC Computer Organization	• To introduce the basic terminology of computer hardware. • To familiarize the functional units of a

		• computer system.
		• To understand the basic operation of a computer system.

DEPARTMENT OF MALAYALAM (General Course)

Semester	Course	Outcome
I	1A07MAL: Sahithyaganangal	• To introduce poems stories and different forms of Malayalam literatures • To cultivate interest different forms of poems among the students and there with make them interested in Malayalam literatures • To make them understand the difference between poems and pros • To make them aware about the different forms of pros
II	2A08MAL: Gadyaroopangal	• To differentiate the different forms of the drama, novel, criticism and auto biography • To make awareness among the students about the different features and the applications of cross literatures
III	3A09MAL: Malayala kavitha	• To introduce the importance of Classic Neo Classic romantic and modern Malayalam literatures. • To differentiate between all the classic and modern literature as well as to give keen insight into the changes that have been taken place till the post modern age. • To introduce various authentic writers of different ages in Malayalam poem

IV	4A10MAL: Rachana, Vivarthanam	• To make the students to handle Malayalam language and literatures in a highly sophisticated way and therewith not to make errors when they handle the language • To make an awareness of transition of languages in the course
I	1A07-1MAL: Sahithyaroopangal	• To introduce different forms of literatures such as poems, novel drama and pros • By introducing different forms of Malayalam literature cultivate in them intrest in reading as well as in writing • To enlarge awareness in translation of languages among the students
II	2A08-1MAL: Gadyamathrukakal	• To introduce different forms of Malayalam literature such as pros and local history to make them understand features and peculiarities of the language • To introduce the history of origin of languages and the influence of other languages in Malayalam
I	1A07-2MAL: Sahithyavum Vivarthanavum	• To introduce different forms of literature so as to make them aware the different features of the language. • To make students understand the beginning of the Malayalam language so as to give a deep insight into the growth of the language.
II	2A08-2MAL: Sahithyavibhagangal	• To introduce different forms of literatures such as story, novel, drama and screen play • By introducing different forms of Malayalam literature cultivate in them interest in reading as well as in writing.

DEPARTMENT OF PHYSIOLOGY (Complementary)

Semester	Course	Outcome
I	1C01 PLY,Biological Chemistry	• To give a comprehensive idea about the basic concepts of biochemistry • To augment the core courses of the student
II	2C02 PLY Cell Biology	• To give an over view of the basic concepts and techniques involved in the study of cells • To provide an insight in to the complexity of the cellular machinery.
III	3C03 PLY Human Physiology I	• To provide a comprehensive idea of the physiological features of the human body and functioning of the various systems in the human body • To give the student a basic idea in applied areas such as on first aid and public health
IV	4C04 PLY Human Physiology II	• To provide a comprehensive idea of the physiological features of the human body and functioning of the various systems in the human body • To give the student a basic idea in applied areas such as on first aid and public health

English (General Course)

English is a language of global communication and a language that offers infinite opportunities for learning and career development. It is evident that English Language learning is a pressing need of the times in view of the fact that a fairly high degree of proficiency in English and communication skills enhance students' employability. The Common course for students has been comprehensively

designed to meet the needs of the students of the Undergraduate classes of Kannur University who find English language learning a daunting task. Inadequate language skills have been found to seriously impede their performance in many spheres such as higher education, the job market, interviews, formal presentations and impromptu situations.

The course has been conceived in such a way as to make the learning of English a rewarding and enjoyable experience. It seeks to make classroom teaching learner-centred and help teachers free themselves from the inhibiting confines of the single-directional, lecture-oriented monotony. The tasks incorporated in the texts call for an integrated application of conventional language skills, as well as the equally important reference skills. The students will learn to identify the general features of discourse development which may be realized differently in specific communicative situations. The course aims at breaking new grounds in English Language Teaching by providing the teacher new course material and a whole variety of refreshingly new language exercises that will ensure increased student participation.

Semester	Course	Outcome
I	1A01ENG COMMUNICATIVE ENGLISH I	• The modules of the course have been planned and selected in such a way as to help the students to develop an overall knowledge and understanding of English Grammar and Phonetics and communicate ideas and information effectively. • The student will learn to ask relevant questions when necessary, make appropriate and meaningful comments, and insightful observations. • The student will select and use appropriate listening strategies according to the intended purpose, such as solving problems, interpreting and evaluating techniques and intent of a presentation, and taking action in career-related

			situations.
			• The students will be familiarized with the basics of oral communication and thus develop their ability to use English for performing some of the most vital communicative functions in academic, social and professional situations
			• The student will develop global intelligibility.
			• The student will follow the writing conventions correctly without making any serious lapses in grammar or word choices.

I	1A02ENG LANGUAGE THROUGH LITERATURE I		• To highlight the reciprocity of the relationship between writing and reading.
			• To develop critical insights and faculties.
			• The lexical exercises have been devised to initiate problem-solving activities which facilitate learning.
			• The exercises are meant for the optimum exploitation of the language aspects of each text.
			• The student will recognize and explain those elements in texts that prompt a personal response, such as connections between one's own life and the characters, events, motives, and causes of conflict in texts.
			• The student will learn to examine a literary selection from several critical perspectives.

II	2A03ENG COMMUNICATIVE ENGLISH II	• To develop skills such as reading academic texts effectively and efficiently. • Doing basic research, taking part in academic discussions, writing academic assignments, presenting at student seminars, managing studies, including time-management and learning to use English in a range of study contexts. • The student will apply oral communication skills to interviews, group presentations, formal presentations, and impromptu situations • The course will also train the student to write fluently for a variety of occasions, audiences and purposes, making appropriate choices regarding style, tone, level of detail and organization. • Making the students active and focused readers who can read with greater understanding, more critically, and in a more time-efficient way
II	2A04ENG LANGUAGE THROUGH LITERATURE II	• To sensitize students about the continuing nature of environmental problems which are complex and varied in nature, and global in their ultimate impact. • To initiate a discussion about human collusion in the degradation of the environment. • To lead them to concrete action for saving the environment.

		• To instil civic consciousness
		• The students will determine the meaning of vocabulary items from their context in the reading, evolving a content-based approach which will help them to subsequently develop their vocabulary by using words and idioms in personalized contexts.
III	3A05ENG: READINGS IN PROSE &POETRY	• The student understands the timeless significance of good literature which transcends the limitations and peculiarities of the age it was written in.
		• The student will acquire an understanding that language and literature are primary means by which culture and human values are transmitted.
		• The student will understand the subtleties of literary devices and techniques in the comprehension and creation of communication.
		• The student will understand the use of images and sounds to elicit the reader's emotions in both non-fiction and poetry.
		• The student will learn to see writing as an act of communication which has a purpose, a context and an audience.
IV	4A06ENG : READINGS IN FICTION AND DRAMA	• The student will understand the power of language.
		• The student will understand production elements that contribute to the effectiveness of a specific medium
		• The student will understand why certain

		literary works are considered classics
		• The student will identify universal themes prevalent in the literature of all cultures.
		• The student will analyse the effectiveness of complex elements of plot, such as setting, major events, problems, conflicts and resolutions.
		• The student will understand the relationships between and among elements of literature, including characters, plot, setting, tone, point of view and theme.

B.COM COMPUTER APPLICATIONS

Programme Specific Outcome

1. To build a strong foundation of knowledge in different areas of Commerce
2. To develop the skill of applying concepts and techniques used in Commerce
3. To develop an attitude for working effectively and efficiently in a business environment
4. To integrate knowledge, skill and attitude that will sustain an environment of learningand creativity among the students
5. To expose students about entrepreneurship
6. To enable a student to be capable of making decisions at personal and professional level
7. The objective of this programme is to make the students capable of managing the office
8. activities with the help of information technology

Semester	Course	Outcome
I	1B01 COM : Management Concepts &Principles	• To acquaint the students with the principles of management, help in understanding various functions of management and developing management skills.

I	1B02 COM : Financial Accounting	• To develop among the students a conceptual understanding of the fundamentals of financial accounting system and to equip them with basic skills for recording various types of business transactions. • To help the students to acquire the conceptual knowledge of accounting and to help them to learn the techniques of preparing the financial statements.
I	1C01 COM : Business Statistics	• To familiarize the students with the basic statistical tools used to summaries and analyse quantitative information for decision making.
II	2B03 COM: Principles of Marketing	• To provide basic knowledge about the concepts, principles, tools and techniques of marketing.
II	2B04 COM: Human Resource Management	• To familiarize the students with the basic principles of Human Resource Management
II	2C02COM: Quantitative Techniques for Business Decision	• To acquaint students with the basic statistical tools which have application in business and economic situations • To develop mathematical skills needed to analyse numeric data used in business and social sciences.
III	3A11 COM: Disaster Management	• To study the emerging approaches in disaster reduction &management.
III	3A12: Numerical Skills for Business	• To understand basic concepts in mathematics which are applied in the managerial decision making.

		• To develop an understanding of numeric problems in business and social sciences, and techniques used to model such problems.
III	3C03 COM: Basics of Research Methodology	• To help the students to understand how to do research in the area of • Commerce and Management
III	3B05COM: Advanced Accounting	• To help the students to acquire the conceptual knowledge of accounting for special transactions and to help them to learn the techniques of preparing the accounts and financial statements
III	3C04 COM: Business Regulatory Framework	• To provide a brief idea about the framework of Indian Business Laws. • To enable the students to apply the provisions of business laws in business activities
III	3B06COM: Computer Languages and Softwares	• To acquire knowledge about programming languages and to develop skill in creating power point and blog.
IV	4A13 COM: Entrepreneurship	• To help the students understand the concepts of entrepreneurship and to develop the Entrepreneurial skills among them.
IV	4A14 COM: Environment Studies	• To give a general awareness to the students about the environment and sociology, and environmental pollutions.
IV	4B07COM: Income Tax Law and Practice-1	• To give the students the basic idea about the theoretical aspects of income tax in India, and to give an idea about the computation of income under different heads.

IV	4B08 COM: Informatics Skills	• To Know the Fundamentals of Computers and to understand how to use Computer applications in day to Day Applications. • To update and expand basic informatics skills and attitudes relevant to the emerging knowledge society and. • To equip the students to effectively utilize the digital knowledge resources for their chosen courses of study.
IV	4C05 COM: Corporate Law & Business Regulation	• To provide an understanding regarding the administration and management of corporate form of business. • To give a first-hand exposure to corporate laws especially Indian Companies Act 1956.
IV	4B09COM: Electronic Data Processing & Computer Application	• To update and expand skills in electronic data processing and computer application in business operation
V	5B10 COM: Cost Accounting	• To acquaint the students with the basic concepts used in Cost Accounting and the various methods involved in Cost Accounting system.
V	5B11 COM: Corporate Accounting	• To help the students to acquire the conceptual knowledge of Corporate Accounting, and to help them to learn the techniques of preparing the financial statements.
V	5B12 COM: Auditing	• To create awareness among the students about the modern trends and practices of auditing and to inculcate the skills for independently undertaking the audit work.

V	5B13 COM: Income Tax Law and Practice- II	• To give the students an idea about the computation of total income and to know the relevant provisions relating to assessment.
V	5B14COM: Programming Languages	• To acquire knowledge about programming in Java. • To develop skill in writing program in Java.
V	5DO1COM: Insurance and Risk Management	• To give an exposure to the students to the recent developments in the insurance industry and risk management in India.
VI	6B15 COM: Management Accounting	• To acquaint the students with different methods involved in Cost Accounting system. • To provide the students an understanding about the use of financial and cost accounting data, for planning, control and managerial decision making
VI	6B16 COM: International Business	• To enlighten the students on International Business Environment, which includes international financial management, International Marketing and international Currency and to study the impact of globalization on Indian Industry.
VI	6B17 COM: Modern Banking	• To provide to the students an understanding of the fundamentals of banking and impart basic knowledge of modern banking practices
VI	6B18 COM: Financial Markets & Services	• To familiarize the students with the constituents of financial market, their interactions and the services provided by them.

VI	6B19COM: Accounting Packages – Tally	• To acquire knowledge about the tally accounting package. • To develop skill in preparing financial statements in Tally.
VI	6B20 COM: PROJECT	• To learn independently and identify, define and analyse problems and issues and integrate knowledge in a business context. • To understand and apply the theory, the concepts and the tools of analysis to a specific problem situation.

BSc MICROBIOLOGY COURSE OUTCOME

1.Critical thinking & Analytical skills: Students are expected to acquire, articulate, retain and apply knowledge in the field of Microbiology

2. Competency in unique & general laboratory skills: Students will acquire competency in unique and general microbiological laboratory skills, which augment their observational and analytical skills.

3. Safe handling of clinical specimens: Students are expected to achieve training in safe handling and processing clinical specimens.

4.Spreading scientific concepts to community: Students will spread scientific concepts in the community, and share experimental results and analytical arguments clearly, both verbally and in writing.

Semester	Course	Outcome
I	1B01 MCB GENERAL MICROBIOLOGY	• To gain a preliminary understanding about the history and developments in Microbiology • To familiarize with Microbiological techniques • To develop interest in control measures of pathogens and other microbes

II	2B02 MCB MICROBIAL TAXONOMY	• To gain a preliminary understanding about the classification methods in Microbiology • To familiarize with different groups of micro organisms • To develop interest in systematic
III	3A11 MCB BIOCHEMISTRY FOR MICROBIOLOGY	• To gain an understanding about essential Biochemistry required for Microbiology • students • To develop interest in the chemistry of life.
III	3A12 MCB BIOPHYSICS AND BIOINFORMATICS	• To gain an understanding about essential Biophysics required for Microbiology students • To develop interest in the biophysical chemistry of life. • To gain an understanding about introductory and applied Bioinformatics
III	3B03 MCB MICROBIAL PHYSIOLOGY	• To gain a preliminary understanding about the microbial nutrition • To familiarize with energy production in micro organisms
IV	4A13 MCB MOLECULAR BIOLOGY	• To gain an understanding about essential Molecular Biology required for Microbiology • students • To develop interest in the chemistry of life.
IV	4A14 MCB MICROBIAL GENETICS & GENETIC ENGINEERING	• To gain a preliminary understanding about the genetic changes in micro organisms • To familiarize with applied aspects of genetic engineering • To create interest in various aspects of development of GMO

IV	4B05 MCB IMMUNOLOGY	• To gain a preliminary understanding about various immune mechanisms • To familiarize with Immunological techniques • To develop interest in serodiagnosis of infectious diseases
V	5B07 MCB MICROBIAL BIOTECHNOLOGY	• To gain preliminary understanding about fermentation technology • To familiarize with microbial products by fermentation process. • To develop interest in bioinsecticides
V	5B08 MCB BACTERIAL DISEASES	• To gain understanding about various pathogenic micro organisms. • To familiarize with symptoms of common infectious diseases and their diagnostic • procedures and to develop interest in prophylactic measures of infectious diseases
V	5B09 MCB ENVIRONMENTAL MICROBIOLOGY(ELECTIVE)	• To gain a preliminary understanding about Environmental Microbiology • To enhance awareness about xenobiotic pollution • To develop interest in bioremediation.
V	5B 12 MCB VIROLOGY, MYCOLOGY AND PARASITOLOGY	• To gain a preliminary understanding about viral, fungal, protozoan and helminth • pathogens • To develop interest in noting infectious diseases other than bacterial infections
VI	6B15 MCB FOOD MICROBIOLOGY	• To gain a preliminary understanding about Food Microbiology • To enhance awareness about food borne diseases, microbial pathogens responsible

		and
		• food safety
		• To develop interest in advanced food preservation techniques
		• To gain an understanding about food quality standards
VI	6B16 MCB SANITATION MICROBIOLOGY	• To gain a preliminary understanding about Sanitation Microbiology
		• To enhance awareness about waste management.
		• To develop interest in Biogas production and its use
VI	6B17 MCB AGRICULTURAL MICROBIOLOGY AND PLANT PATHOLOGY	• To gain a preliminary understanding of Agricultural Microbiology
		• To enhance awareness about plant diseases and microbial pathogens
		• To develop interest in biofertilizers and organic farming
V	5 D03 MCB MICROBES AND ENVIRONMENT (OPEN)	• To gain an understanding about Environmental Microbiology
		• To enhance awareness about xenobiotic and other pollutions

M A DEVELOPMENT ECONOMICS

The principal aims of objectives of the BA Economics programme are:

1. To provide students an advanced and specialised education in Development Economics;

2. To provide structured curricula which support the academic development of students;

3. To provide and adapt curricula that prepare our post graduates for employment and inculcate quest for PhD and other higher courses in Economics;

4. To provide the students with the opportunity to pursue courses that emphasize quantitative and theoretical aspects of Development Economics;

5. To provide students with the opportunity to focus on applied and policy issues in Economics;

6. To provide a well-resourced learning environment for Economics so as to motivate them to be the future economists.

Semester	Course	Outcomes
I	CORE 1: MICROECONOMIC THEORY –I (ECO1C01)	• To evaluate recent development in Consumer choice • To analyse the modern trends in demand analysis • Advanced understanding of production function • To get deeper knowledge of Markets with asymmetric information • To evaluate Duopoly and Oligopoly markets
I	CORE 2: MACRO ECONOMIC THEORY- I (ECO1C02)	• To understand evolution, growth and Development of Macro Economics • To get deeper knowledge of Process of Income Determination • To understand Neo-classical and Keynesian Synthesis • To look into Behavioural Foundations of Macro Economics • To evaluate Theory of Demand and Supply of Money
I	CORE 3: QUANTITATIVE TECHNIQUES FOR ECONOMIC ANALYSIS (ECO1C03)	• To increase the student's ability to apply proper mathematical tools to specific economic problems • To make appropriate policy decisions

		• For prediction and forecasting of various economic aspects • To get the students into the quantitative aspects of research
I	CORE 4: DEVELOPMENT ISSUES OF INDIAN ECONOMY(WITH SPECIAL REFERENCE TO KERALA)-1(ECO1C04)	• To give students deeper insight of structural aspects of Indian Economy • To Introduce various Developmental Issues of the economy • To evaluate Demographic profile of the country • To evaluate Kerala Economy
II	CORE 5: MICROECONOMIC THEORY –II(ECO2C05)	• To analyse Extension of the traditional theory of the firm • To evaluateTheory of product pricing • To get deeper understanding of Theory of distribution • To introduce General equilibrium and welfare economics
II	CORE 6: MACRO ECONOMIC THEORY-II(ECO2C06)	To get deeper insight of following area • Macro Economics in an Open Economy • Theory of Inflation and Unemployment • Current Controversies in Macro Economics • Macroeconomic Policy
II	CORE 7: DEVELOPMENT ISSUES OF INDIAN ECONOMY (WITH SPECIAL REFERENCE TO KERALA)-II (ECO2C07)	To prove in depth understanding on • Sector wise analysis – Agriculture • Industry and Infrastructure • India and Global Economy • Kerala Economy
II	CORE 8: PUBLIC ECONOMICS-I (ECO2C08)	To have fine idea on • Theory of Social and Private Goods • Structure and growth of public expenditure

		• Public revenue and related aspects
		• Wider view on Public Revenue
		• Fiscal policy
II	CORE 9: BASIC ECONOMETRICS(ECO2C09)	To introduce and evaluate • Evolution, basic information and meaning of the Econometrics • Estimation and testing of different Regression models • Violation of CLRM consequences, detection and remedial measures • Simultaneous equation models • Better understanding of Prediction using econometric models
III	CORE 10: PUBLIC ECONOMICS –II(ECO3C10)	To expertise • Changing dimension of public finance • Overall aspects of Taxation • Trends of public expenditure in India • Budget • Fiscal Federalism
III	CORE 11: ECONOMICS OF GROWTH AND DEVELOPMENT-I(ECO3C11)	To extend supporting hand in understanding of • Measurement of growth and development • Theories of growth • Theories of development • Structuralist and neo liberal paradigms of development • International aspects of development
III	CORE 12: ENVIRONMENTAL ECONOMICS(ECO3C12)	To familiarise student with • The economy and environment • Economics of sustainable development • Climate change and Agriculture development • Environment Impact Assessment (EIA)

		• Regulating pollution
III	CORE 13: FINANCIAL ECONOMICS (ECO3C13)	To get deeper insight of following area • Financial System • Time value of money • Risk and Return • Derivatives Market • Portfolio Management
III	CORE 16: INDUSTRIAL ECONOMICS (ECO3E02)	To assess and apprise • Introducing Industrial economics • Role of Industrialization in Economic Development • Industrial Finance and industrial finance institutions • Industrial growth in India
IV	CORE 14: GLOBAL TRADE AND FINANCE (ECO4C14)	To acquaint with and evaluate • International Trade Theories • Balance of payments • Foreign Exchange Rates • International monetary system and capital flows • Theory of Regional Economic Co-Operation
IV	CORE 15: ECONOMICS OF GROWTH AND DEVELOPMENT-II(ECO4C15)	To make known to and evaluate • Growth, development and social justice • Population and development • Role of capital and technology in development • Industry, agriculture and development • Planning and development
IV	CORE 17: MATHEMATICAL ECONOMICS (ECO4E15)	To introduce and evaluate mathematical understanding of • Theory of Consumer Demand

		• Theory of Production
		• Theory of Markets
		• Linear Models
		• Input Output Analysis
		• Theory of Games
IV	CORE 18: DISSERTATION (ECO4Pr)	To provide better idea about • To formulate a research problem that is unknown to the field and if solved, will yield new knowledge • To devise a research methodology and plan to investigate the problem • To carry out the research in an efficient and effective manner, gathering data that are reliable and relevant to the problem • To analyze the data in a manner that will answer the research problem • To draw conclusions that actually lead to an answer to the research problem • To communicate the results of the research effectively • To communicate the importance of the results of the research to the broader field of inquiry.

BSc PHYSICS

Specific Programme Outcome

1. Understand and apply the principles of Classical mechanics, Quantum mechanics, Thermodynamics, Nuclear physics and Electrodynamics.

2. Understand and apply the principles of Solid state physics, Optics, Photonics and Spectroscopy.

3. Understand the principles of Electronics, Design and test electronic circuits.

4. Understand and apply the principles of Mathematical Physics and Computational Physics and do Error analysis in measurements.

Semester	Course	Outcome
1	Physics Primers	This course will be an introduction to the pursuit of Physics, its history and methodology. The course also aims to emphasize the basic knowledge in vector analysis, waves and oscillations which are central to physics.
II	II- Electronics -I	This course is expected to give a familiarization of various electronic Components such s BJT, FET etc. Also provide fundamentals of number systems and logic gates.
III	Semester : III- Allied Physics	This course is expected to provide an understandings of basic solid-state physics, electricity & Magnetism, Properties of Matter etc.
IV	Semester : IV - Optics	- On successful completion of the course students will be able to: Understand the basics of the Matrix method to solve problems of geometrical optics. - Use the principles of wave motion and superposition to explain the physics of polarisation, interference and diffraction.
V	Electrodynamics - I	On successful completion of the course students will be able to: - Gain elaborated knowledge about electrostatics and laws governing the charge distribution. - Gain ability to apply Laplace equation for calculating potentials. - Study in depth about Polarization, bound charges and boundary condition. - To realize the importance of application of Biot Savarts Law and Amperes law. - To understand the relevance of different

			magnetization and the boundary condition of magnetic field.
V	Thermal Physics	On successful completion of the course students will be able to: - Become familiar with various thermodynamic process and work done in each of these process. - Have a clear understanding about Reversible and irreversible process and also working of a Carnot engine, and knowledge of calculating change in entropy for various process. - Realize the importance of Thermo dynamical functions and applications of Maxwell's relations. - Familiarize in depth about statistical distribution and have basic Ideas about Maxwellboltzman, Bose-Einstein and Fermi Dirac Statistics and their applications.	
V	Classical Mechanics & Relativity	On successful completion of the course students will be able to: - Grasp the fundamentals of different types of frames of references and transformation laws-Both Galilean and Lorentz. - Learn conservation laws of energy and linear and angular momentum and apply them to solve problems. - Learn the basics of potentials and fields, central forces and Kepler's laws. - Familarise with Lagrangian and Hamiltonian formulations of classical	

		mechanics.
		• Gain fundamental ideas of special theory of relativity such as length contraction and time dilation and mass –energy invariance.
V	Python programming	• Introduce the fundamentals of python programming including various data types, syntax, iterations and loops, conditional formatting, function handling, graphics etc. • Course also provides theoretical and practical knowledge in numerical computation using python.
V	Atomic, Nuclear and Particle Physics	• Provides detailed study of differ atom models, energy levels and spectral spitting in atoms. Thenuclear physics part focus on the nuclear structure, nuclear models and different types ofdecay processes in nucleus. • The study of different classes of fundamental interactions, elementary particle classifications, Quark model etc also have been included.
VI	Electrodynamics -II	• To enable students to solve a variety of problems related to Faraday's law of induction and Maxwell's equations. Student is expected to explain term displacement current as well. • Understand the relevance of displacement current in the context of electromagnetic wave propagation. • Study different applications of electromagnetic field.

VI	Photonics & Spectroscopy	• To make students familiar with molecular spectroscopy and have gained basic ideas regarding microwave spectroscopy, infrared spectroscopy and Raman Spectroscopy. • To gain basic knowledge of laser and working of different type of lasers, Basic knowledge of fibre optics and holography.
VI	Quantum mechanics	After successful completion of the course, the student is expected to: • To become familiar with Blackbody radiation, Ultraviolet catastrophe,PhotoElectric effect and Compton Effect and hence be aware how quantum theory emerged. • Gain a clear knowledge about wave properties of particles,De Broglie waves and its implications on the uncertainty principle. • Study the Bohr Atom model in detail and understand about atomic excitations. • Grasp the idea of Wave Mechanics and gain the concept of eigen values, eigen functions and learn the basic postulates of quantum mechanics • To find solution to Schrödinger's equation for many systems such as particle in a box, Hydrogen Atom and familiarize with different quantum numbers.
VI	Electronics-II	After successful completion of the course, the student is expected to:

		• Have knowledge of different types of transistor configuration, biasing, circuit analysis.
		• Have knowledge of the working of different types of oscillator circuits and role of feedback networks.
		• Understand the integrated circuits and working of Operational Amplifiers(OPAMP).
		• Have Knowledge of various know about various number systems and their applications , flip flops and counters.
	Astronomy and Astrophysics	Knowledge of origin and evolution of universe, Stellar classification, Different stages of stellar evolution. Stellar magnitudes and measurements. Study the structure and properties of sun, different celestial objects.

CHEMISTRY (Complementary)

Programme Specific Outcome

1) To inculcate the knowledge in Chemistry.

2) To generate the scientific aptitude/attitude in the students.

3) To improve the laboratory skills among the students.

4) To develop partial skills such as experimental and observation.

Semester	Course	Outcome
I	1C01CHE Chemistry for Physical & Biological Sciences	• Understand the atomic structure, basics of quantum chemistry and its applications. • Explain theories of chemical bonding

		and molecular structure.
		• Classify environmental pollution and recognise the causes of pollution.
		• Understand the basic concept of Chemical equilibrium and theories of acids and bases
		• Calculate pH values
		• Explain common ion effect and solubility product
II	2C02CHE Chemistry for Physical & Biological Sciences	• Understand the basic concept of classification, IUPAC nomenclature, bonding and structure of Organic compounds
		• Explain the concept of aromaticity and non-benzenoid aromatics
		• Understand the basic concepts of chemical equilibrium. Explain colloids, their properties and applications
		• Illustrate the laws of photochemistry and explain the photochemical phenomena such as Photosensitization, quenching, Fluorescence, Phosphorescence, Chemiluminescence and Bioluminescence.
		• Familiarise different types of analytical methods in chemistry and explain the principle of colorimetry
		• Explain the principles underlying the qualitative and quantitative analysis
III	3C03CHE Chemistry for Biological Sciences	• i)Understand the basic concept of Coordination Chemistry,

			nomenclature, Werners coordination theory and Valance bond theory of coordination complexes
			ii) Write the name of Coordination compounds
			iii) Explain Werners coordination theory and Valance bond theory of coordination complexes
			iv) Explain the application of coordination complexes
			• i)Understand the electron displacement effects in organic molecules
			ii) Explain the mechanism of nucleophilic substitutions and eliminations in alkyl halides
			iii)Explain the mechanism of aromatic electrophilic substitution reactions
			• i)Classify the isomerism in organic molecules
			ii) Distinguish the geometrical isomers and explain their stability
			iii) Explain the characteristics of chiral compound
			iv) Explain the conformational isomers in alkanes and cycloalkanes
			• i)Explain the important types of polymerization, thermoplastics and thermosetting plastics
			ii) Understand the characteristics of biodegradable plastics
			• i)Understand the basic concept of thermodynamics and laws of

			thermodynamics
			• i)Understand the basic concept of chemical kinetics ii)Calculate Ea from the values of k at two temperatures iii) Explain homogeneous catalysis, heterogeneous catalysis and Characteristics of catalysis reactions
IV	4C04CHE Chemistry for Biological Sciences		• Illustrate the preparatory methods of glucose and fructose and explain their configurations, familiarize the structure and properties of sucrose and polysachrides • Know the structure of important five membered and six membered heterocyclic compounds and explain their reactivity and important reactions • Explain the preparation and properties of Quinoline and Isoquinoline • Understand the structure and functions of neuclic acids , Classify amino acidsand explain the structure of protein and its importance • Understand the mechanism of enzyme action , enzyme catalysis Know the structure of Vitamin A, B and C. and hormones progesterone, Testosterone,cortisone, adrenaline and Thyroxin • Understand the importance of metal ions in biological systems and Mechanism of O_2 and CO_2

		transportation Nitrogen Fixation Na-K pump
IV	4C05 CHE COMPLEMENTARY CHEMISTRY PRACTICAL	• Apply the theoretical concepts while performing experiments. • Acquire practical skill to estimate acid, base, oxidizing agents etc by volumetric titrationmethod • Acknowledge experimental errors and their possible sources. • Design, carry out, record and analyze the results of chemical experiment. • Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts Learns the effective usage of chemicals.

HINDI (General course)

Semester	Course	Outcome
I	Core Course I: Hindi Kavitha	• Understanding the role played by the poets of bhakthikal in literature and society. • Understanding the philosophy of life as well as poems of chayavad. • Understanding the poems of Modern poets in context with their experience of life. • Understanding the contemporary spirit of the poets.
II	Core Course II:Rachana Thatha Prayog	• Understanding Fundamental principles of Hindi Grammer. • Understanding the correct usage of hindi grammar.

| | | • Developing significant increase in word knowledge. |
		• Develop communicative skill in Hindi.
III	Core Course III:Katha Sahithya	• Analyze variety of short stories in the cultural and historical context.
		• Analyze novel in the modern context.
		• Understand the story content and structure in depth.
		• Collaborate with peers of roll playing story analysis and presentations
IV	Core Course IV:Natak Aur Ekanki	• Understand the social and artistic movements that have shaped theatre.
		• Analyse and interpret texts and performances both in writing and orally.
		• Develop and apply process skills in rehearsal production and class room settings.
		• Demonstrate problem solving skills in various theatrical context.
I	Core Course V: Kavitha Aur Kahani	• Understand the Hindi poetry.
		• Understand Hindi short stories.
		• Understand the style and trends in Hindi poetry and short story right from the ancient to post modernism.
		• Develop creative thinking.
II	Core Course VI: Vyavaharik Hindi	• Understand the basic grammer of hindi language.
		• Understand the technic of letter writing and translation of hindi.
		• Develop communicative skill in hindi.
		• Develop vocabulary in hindi.

Semester	Course	Outcome
I	Core Course VII: Naya Sahithya	• Understand the style of hindi prose. • Understand history of hindi prose. • Develop critical thinking • Analise hindi prose and hindi criticism.
II	Core Course VIII: Sahitya Aur Prayog	• Understand the stories. • Understand the importance of letter writing and translation. • Develop communicative skill in hindi. • Develop creative writing skill in hindi.

Mathematics (Complementary)

Semester	Course	Outcome
I	1C01 MAT-PH: Mathematics for Physics I	• Understand the concept of Differentiation and successive differentiation. • Understand Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem, Cauchy's mean-value theorem,. • Understand the Taylor's theorem , expansions of functions – Maclaurin's series, expansion by use of known seriesr • Understand the Matrices and System of Equations, Linear Transformations • Understand Rank of a matrix, elementary transformations, normal form of a matrix, inverse of a matrix, solution of linear system of equations. • Understand Linear transformations, orthogonal transformation, vectors –

		• linear dependence
		• Understand Derivative of arc, curvature, Polar coordinates, Cylindrical and Spherical co-ordinate
II	2C02 MAT-PH: Mathematics for Physics II	• Understand partial derivatives, homogeneous functions, Euler's theorem, total derivative, differentiation of implicit functions, change of variables
		• Understand Integration and Integration by Successive Reduction , Integration of Trigonometric Functions
		• Comprehend Applications of Integration
		• Comprehend Eigen values, Eigen vectors, properties of Eigen values,
		• Understand Cayley- Hamilton theorem, Diagonal form, similarity of matrices, powers of a matrix, canonical form, nature of a quadratic form
III	3C03 MAT-PH: Mathematics for Physics III	• Understand the concept of Multiple Integrals and solves problems
		• Understand Vector Differentiation
		• Understand Laplace Transforms and its Applications
		• Understand Fourier Series and Half range expansions
IV	4C04 MAT-PH: Mathematics for Physics IV	• Understand Wave Equation, Solution by Separating Variables, D-Alembert's solution of the wave equation.Understand the basics of PN

		junction diode, Zener diode and their applications
		• Understand Heat Equation and Solution by Fourier Series
		• Understand Line integrals , path independence, conservative fields and potential functions, Green's theorem in the plane
		• Understand Surface area, surface integrals, Stoke's theorem, Divergence theorem
		• Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule
		• Understand Numerical Solutions of Ordinary Differential Equations by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.
I	1C01 MAT-CS: Mathematics for Computer Science I	• Understand Successive differentiation and Leibnitz's theorem for the nth derivative of the product of two functions.
		• Understand Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem and Cauchy's mean value theorem.es.
		• Understand Taylor's theorem, expansions of functions – Maclaurin's series, expansion by use of known series and Taylor's series.
		• Understand the method of finding limits of indeterminate forms.
		• Understand Polar, Cylindrical and

		Spherical co-ordinates.
		• Understand Rank of a matrix, elementary transformation of a matrix, equivalent matrices, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix and partition method of finding the inverse..
		• Understand solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear homogeneous equations.
		• Understand Linear transformations, orthogonal transformation and linear dependence of vectors.
		• Understand methods of curve fitting, graphical method, laws reducible to the linear law, principles of least squares, method of least squares and apply the principle of least squares to fit the straight line $y = a+bx$, to fit the parabola $y=a+bx+cx2$, to fit $y = axb$, $y =aebx$ and $xyn=b$
II	2C02 MAT-CS: Mathematics for Computer Science II	• Understand Functions of two or more variables, limits and continuity.
		• Understand partial derivatives, homogeneous functions, Euler's

		theorem on homogeneous functions, total derivative, differentiation of implicit functions and change of variables.
		• Understand Reduction formulae for trigonometric functions and evaluation of definite integrals , and
		• Understand Substitutions and the area between curves, arc length, areas and length in polar coordinates.
		• Understand Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form and triple integrals in rectangular coordinates.
		• Understand Eigen values, Eigen vectors, properties of Eigen values, Cayley- Hamilton theorem, reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form and nature of a quadratic form
III	3C03 MAT-CS: Mathematics for Computer Science III	• Understand Ordinary differential equations, Geometrical meaning of $y'=f(x, y)$ and Direction Fields.
		• Understand Methods of solving Differential Equations: Separable ODEs, Exact ODEs, Integrating Factors, Linear ODEs and Bernoulli Equation.
		• Understand Orthogonal Trajectories,

		Existence and Uniqueness of Solutions.
		• Understand Second order ODEs, Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian, Non homogeneous ODEs and Solution by variation of Parameters
		• Understand Laplace Transform, Linearity, first shifting theorem, Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem, Convolution, Integral Equations, Differentiation and integration of Transforms and to solve special linear ODE's with variable coefficients and Systems of ODEs
		• Understand Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions.
		• Understand Partial Differential Equations and to solve PDEs by separation of variables and by use of Fourier series.
IV	4C04 MAT-CS: Mathematics for Computer Science IV	• Understand the concept of a graph, graphs as models, vertex degrees, sub graphs, paths and cycles, matrix representation of graphs, trees and

		connectivity – definition and simple properties.
		• Understand Linear Programming Problems, their canonical and standard forms.
		• Understand Methods to solve LPP : Graphical solution method and Simplex method
		• Understand Transportation problems, transportation table, loops. Solve a Transportation Problem by finding an initial basic feasible solution and then by using the transportation algorithm known as MODI method.
		• Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule
		• Understand Numerical methods to find Solutions of Ordinary Differential Equations: Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.