

## **Program Objective (Master of Business Administration)**

MBA at MACFAST is a two year Post Graduate Programme for 120 students. It is designed with the objective of transforming young graduates into competent, responsible and value driven professional managers. We offer specialization in the field of Marketing, Finance, Human Resource, Information Systems and Operations Management. This program enables the students to cope up with cooperate, organizational and societal challenges of future. The objectives include:

- To develop young MBA aspirants into professional managers who can contribute to the growth of business and industry in India and abroad.
- To develop astute leaders with a strong ethical background who can efficiently and effectively manage business amidst environmental turbulences.
- To nurture entrepreneurial skills among young generation and make them effective change agents.
- To contribute towards better management practices in the country by offering quality management education.
- To facilitate the Institutions to contribute towards the management of non-corporate sectors and social enterprises with main focus on local and regional level.

**The accomplishments of the course objectives are possible only through synergized efforts of stakeholders at the micro level**

## **Programme Outcomes**

- Application oriented Knowledge in Domain and Business Environment (AKDBE)
- Critical Thinking, Business Analysis, Problem Solving and Innovative Solutions (CBPI)
- Social Responsiveness and Ethical Standards (SRES)
- Astute Leadership and Synergy (ALS)
- Effective Communication (EC)
- Global Exposure and Cross-Cultural Sensitivity (GECCS)

## **PROGRAM SPECIFIC OBJECTIVES**

### **MBA FINANCE**

- Our MBA programme in Finance aims to build foundations for both practical and theoretical knowledge that helps in understanding concepts such as:
  - Investment strategies
  - Securities and portfolio management
  - Local and global economics.
  - Direct and indirect taxation
  - Financial services
  - Business analytics
- Students who opt for MBA in Finance, gain skills both in the fields of finance as well as business that are essential for a good career. Also to impart in-depth knowledge of finance theories, practices and to elucidate in detail the organizational context of financial decision making.
- The program equips the students to analyze company reports, forecast economic trends, take measures to value stock, helps to choose investment portfolios, analyze risk and return, various financial services available in the economy. By the proper integration of various techniques, aspirants will learn to analyze financial data effectively. Also, they will learn to apply the principles of financial risk management.
- Our graduate in MBA Finance can work in various fields such as investment banking, taxation, tax planning, financial statement reporting and analysis, hedge fund management, international finance, asset finance, financial analysis and insurance management.

## **MBA MARKETING**

- The purpose of this program is to introduce students to the basic concepts of marketing, thereby acquiring and applying relevant marketing knowledge and skills to manage the complexities of the market.
- The program enables the participants to come with appropriate marketing strategies that will help in achieving the organization's goals.
- To impart in-depth knowledge of marketing theories and practices and to elucidate in detail the organizational context of marketing decision making.
- The program equips the students with theories, methods and systems needed for the strategic analysis, development, execution and measurement of marketing programs.

## **MBA HR**

- This program aims at the development of critical skills, knowledge and a holistic sensitive HR Professional who is at ease with both core business and people related challenges.
- The program delivered by experienced faculty and industry practitioners, provides rigorous inputs on a selection of specially designed contemporary courses to develop the required HR specialist competencies and the right attitude for today's business environment.
- Career growth in the field of HR by developing skills and competencies required to meet the demands of organizations today.
- Training in competencies such as knowledge of the business, personal credibility, functional HR expertise, and management of Change.
- Grooming talented and dedicated HR specialists for a variety of sectors such as Manufacturing, Retail, IT/ITes, FMCG, Banking, Financial, Insurance and Consulting.
- Emphasizing on development of personal and social competencies to provide a competitive edge for formulating sustainable HR solutions for the business challenges.

## **MBA OPERATIONS**

- The Program discusses the basic concepts related to the Operational aspects of Production Management.
- Helps to learn the tools that aid in devising the methods of goods production.
- Teaches students the advanced techniques for managing operations.
- Discuss about the factors affecting production and operations and teaches qualitative and quantitative forecasting techniques
- Provide an insight about the practical aspects and latest developments in the field of Inventory control and management.
- Aims at introducing the concept and techniques for Quality Management and control and how and why it is important in the present context.

- Deals with the problems and challenges faced in the field of logistics and Supply Chain Management. It teaches the technical and managerial elements related for the smooth functioning of the field.
- Provides knowledge about basic toolkit necessary for decision making with regard to Operations Department

## **MBA INFORMATION SYSTEMS**

- This program provides a foundation in the theory and practical application of information systems within an organization. Managing, analyzing, designing, and implementing an MIS and its strategic use will be the focus of the program. Strategic value, methodologies, quality, decision making, modeling, re-engineering, software, hardware, and ethics will all be included.
- This program is an introduction to Management Information Systems solutions through business-driven information systems. Focused on business concepts first and the technology that supports it second. We will have students APPLY what they have learned. This approach allows students to understand that business initiatives drive technology choices and decisions.
- We will incorporate numerous exercises to help students apply critical thinking elements in the program. Business Driven Information Systems is designed to give students the ability to understand how information technology can be a point of strength for an organization.
- Completing this program will enable the students to:
  1. Recognize contemporary MIS theory and how information systems support business strategy, business processes, and practical applications in an organization.
  2. Interrelate how various support systems can be used for business decisions and to sustain competitive advantage.
  3. Describe how the Internet and World Wide Web provide a global platform for e-business, business mobility and communications, collaboration, and cloud computing.
  4. Express the proven value of, and relationship between business data, data management, and business intelligence.

5. Analyze systems development and project management methodologies.
6. Combine analytical thinking, creativity and business-problem-solving as applied to ongoing MIS challenges, future trends, and relevant case studies.
7. Express ethical awareness and moral reasoning applied to a MIS problem, issue or case study

<b>COURSE SPECIFIC OBJECTIVES</b>		
<b>Course</b>	<b>Objectives</b>	<b>Outcome</b>
<b>MANAGEMENT CONCEPTS AND ORGANISATIONAL BEHAVIOUR</b>	<ul style="list-style-type: none"> <li>● To provide the participants conceptual framework in Management functions and practices</li> <li>● To provide basic insights into Individual and Group Behaviour in Organisations</li> <li>● To introduce framework of Organisation Structure, Climate</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will get basic insights into Management concepts and Functions</li> <li>● At the end of this course, participants are expected to acquire basic knowledge about role of individual and group behaviour in organisations</li> <li>● The participants are expected to gain knowledge about recent trends in Managerial Process</li> </ul>
<b>BUSINESS COMMUNICATION</b>	<ul style="list-style-type: none"> <li>● To familiarize the participants with the basics of business communication</li> <li>● To make the participants appreciate the application of these concepts in business environment</li> <li>● To sensitize the participants to non-verbal communication and effective utilization of the same.</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to understand the nuances of communication including body language</li> <li>● The participants will be able to utilize all forms of communication effectively for their professional purpose and growth.</li> </ul>
<b>MANAGERIAL ECONOMICS</b>	<ul style="list-style-type: none"> <li>● To familiarize the participants concepts and techniques in Economics</li> <li>● To make the participants appreciate the applications of core concepts in economics for managerial decision making</li> <li>● To sensitize the participants how economic environment affects Organizations</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to understand economic concepts used for managerial decision making</li> <li>● Appraise how demand and supply interact in various market structures to determine price and quantity of goods and services produced and consumed</li> <li>● At the end of this course, the participants will get conceptual clarity and logical aspects of economic behaviour of individuals, firms and markets.</li> </ul>
<b>ACCOUNTING FOR MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● This basic course aims to introduce the nature and purpose of financial statements in relation to decision making</li> <li>● The course aims to develop the ability to understand a</li> </ul>	<ul style="list-style-type: none"> <li>● By the end of the course, students are expected to state the uses and users of accounting information</li> <li>● After the completion of this course, the students will be able to analyse, interpret and</li> </ul>

	<p>basic accounting system; to record, classify, and summarize financial data.</p> <ul style="list-style-type: none"> <li>● To sensitize the participants about different types of accounting used for decision making</li> </ul>	<p>communicate the information contained in financial statements</p>
<b>QUANTITATIVE METHODS</b>	<ul style="list-style-type: none"> <li>● To familiarize the participants with Mathematical and Statistical techniques applied in Management.</li> <li>● To familiarize the students to solve statistical problems for summarizing, analysing, and interpreting Data</li> <li>● To impart fundamentals of Hypothesis Testing</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to understand framework of law applicable to business</li> <li>● The participants will get insights into provisions of business law</li> <li>● At the end of this course, the participants will be aware of legal requirements for the pursuing a business</li> </ul>
<b>LEGAL ENVIRONMENT OF BUSINESS</b>	<ul style="list-style-type: none"> <li>● To provide the participants basic framework of Laws applicable to Business</li> <li>● To provide basic insights into provisions of business laws</li> <li>● To sensitize the participants legal framework required for starting a Business</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to understand framework of law applicable to business</li> <li>● The participants will get insights into provisions of business law</li> <li>● At the end of this course, the participants will be aware of legal requirements for the pursuing a business</li> </ul>
<b>ENVIRONMENT MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To familiarize the participants framework of Natural Environment and Importance of Protection of Natural Resources</li> <li>● To make the participants aware about pollution and waste management</li> <li>● To sensitize the participants about Business Environment framework</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to understand the need for protection of natural environment</li> <li>● The participants will get basic insights into the problem of pollution and waste management</li> <li>● At the end of this course, the participants will get an overview of the business environment prevailing in the country</li> </ul>
<b>FINANCIAL MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● This Course aims to Introduce Objectives and Functions Financial Management, its importance, its applications in business</li> <li>● This Course aims to understand the relationship of Financial Management with the business environment and the role of Financial Manager.</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to understand both the theoretical and practical role of financial management in business.</li> <li>● The participants may be enabled to apply the fundamental concepts and tools of Financial Management.</li> <li>● This course will help the participants to analyse the finances of firms in terms of their performance and capital.</li> </ul>
	<ul style="list-style-type: none"> <li>● To introduce the key business</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to</li> </ul>

<b>MARKETING MANAGEMENT</b>	<p>function of Marketing with modern realities</p> <ul style="list-style-type: none"> <li>● To provide the participants conceptual framework of Marketing</li> <li>● To impart key insights into the practical aspects of Marketing in different type of Organisations</li> </ul>	<p>understand the framework of Marketing Function in Organisations</p> <ul style="list-style-type: none"> <li>● The participants may be able to solve Strategic Marketing Problems</li> <li>● At the end of this course, the participants will be able to specialise in various elements of Marketing</li> </ul>
<b>HUMAN RESOURCE MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To provide participants a synthesized framework of Human Resources theory &amp; practice</li> <li>● To impart practical insights into HR Practices in Organisations</li> <li>● Learn to align HR Systems with the Strategic Business Objectives of a Firm.</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to get Conceptual Clarity in Human Resources Management</li> <li>● At the end of this Course the participants may get insights into HR Practices in Organisations</li> <li>● The participants will understand the interrelationship between HRM and Business Processes</li> </ul>
<b>OPERATIONS MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To provide basic understanding of the Production / Operations Management function in Organizations.</li> <li>● To make the participants aware of the quality tools in Operations Management.</li> <li>● To sensitize the participants about the current Operations Management Process and Strategies followed in India and abroad</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to understand various concepts and theories related to operations management.</li> <li>● The participants will get basic insights regarding the various operations management strategies adopted by global firms.</li> <li>● The participants will be able to understand emerging concepts and best practices followed in manufacturing firms.</li> </ul>
<b>MANAGEMENT SCIENCE</b>	<ul style="list-style-type: none"> <li>● To Familiarize the participants with the scope and applications of Operations Research in Managerial decision making</li> <li>● To impart basic insights to students about use of various Scientific Tools and Models in OR for Business Analysis</li> <li>● To provide basic insights into Decision Science and Decision Environment</li> </ul>	<ul style="list-style-type: none"> <li>● At the end of this Course, the participants may get basic insights into Applications of Operations Research in Managerial Decision Making</li> <li>● The Participants will get familiar with Scientific Tools and Models in OR for analysing the Business</li> <li>● The participants will be able to understand basics of Decision Science</li> </ul>



<b>MANAGEMENT INFORMATION SYSTEM &amp; CYBER SECURITY</b>	<ul style="list-style-type: none"> <li>● To understand the Importance of Information System in Business</li> <li>● To make the participants familiarize with the Information Technologies and Methods used for effective Decision making in an organization.</li> <li>● To understand the security and ethical issues in Information systems.</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will get basic insights into the Flow of Information in an Organisation</li> <li>● The participants will understand how data and information is used in the process of managerial decision making</li> <li>● The participants are expected to get basic insights into the security aspects in Information Systems</li> </ul>
<b>BUSINESS RESEARCH METHODS</b>	<ul style="list-style-type: none"> <li>● To prepare the students for projects through providing basic aspects of Research Methodology</li> <li>● To make the participants familiar with different phases of Research</li> <li>● To Equip the participants basic insights into Data Analysis and Report Writing</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will get basic insights into the Process, Methods and Techniques used in Business Research</li> <li>● The participants will understand how data is collected and analysed for decision making</li> <li>● The participants are expected to get basic insights into the use of Statistical Software and MS Excel in Business Research</li> </ul>
<b>ENTREPRENEURSHIP DEVELOPMENT</b>	<ul style="list-style-type: none"> <li>● To Provide the Participants basic understanding about the Role and Significance of Entrepreneurship in an economy</li> <li>● To Instill a Spirit of Entrepreneurship among the Student Participants</li> <li>● To make the Participants aware about the Management of Small and Medium Enterprises</li> </ul>	<ul style="list-style-type: none"> <li>● The Participants will be provided basic insights into the Process of Entrepreneurship and its Nuances</li> <li>● The Participants may get inspired by the Spirit of Entrepreneurship</li> <li>● The Participants will get an idea about the Status of Entrepreneurship Ventures in India including Women Entrepreneurship</li> </ul>
<b>BIG DATA AND BUSINESS ANALYTICS</b>	<ul style="list-style-type: none"> <li>● Understand what Business Analytics is, why it is used, and by whom</li> <li>● Understand the key concepts of Business Analytics and its Practical Application in Decision Making</li> <li>● Apply relevant Analytics tools and techniques to solve real world Business Problem</li> </ul>	<ul style="list-style-type: none"> <li>● Use R to create basic plots</li> <li>● Identify and apply appropriate Analytic Technique to solve Business Problem</li> <li>● Derive Actionable insights from data for Decision Making</li> </ul>

<b>BUSINESS ETHICS AND CORPORATE GOVERNANCE</b>	<ul style="list-style-type: none"> <li>● To introduce Ethics as an important Component in Business Administration</li> <li>● To provide the Participants the Relevance and Role of Indian Practices in Business</li> <li>● To Discuss and Analyse relevant Case Studies related to Indian Ethos and Values from the Business World</li> </ul>	<ul style="list-style-type: none"> <li>● The Participants will understand the importance of Ethics in Business Administration</li> <li>● At the end of the Course, the Participants will understand the relevance of Indian Practices in Management based on Ethical foundation</li> <li>● The Case Studies on Indian Ethos and Values will throw light into the richness of Indian tradition in Corporate Governance</li> </ul>
<b>SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To have an in depth knowledge of the theory as well as practice of investment decision making</li> <li>● To Know the theory and practice of portfolio management</li> </ul>	<ul style="list-style-type: none"> <li>● Understand the various alternatives available for investment</li> <li>● Learn to measure risk and return. Find the relationship between risk and return</li> <li>● Find the relationship between risk and return</li> <li>● Gain knowledge of the various strategies followed by investment practitioners</li> </ul>
<b>MANAGEMENT OF BANKS AND FINANCIAL INSTITUTIONS</b>	<ul style="list-style-type: none"> <li>● To acquaint the students with concepts of Banks and Financial Institutions.</li> <li>● To familiarize various Techniques of Managing Banks and Financial Institutions.</li> </ul>	<ul style="list-style-type: none"> <li>● Develop conceptual knowledge on Banking practices and functioning of Financial Institutions</li> <li>● Ability to manage various processes in Banks and Financial Institutions.</li> </ul>
<b>INTEGRATED MARKETING COMMUNICATIONS</b>	<ul style="list-style-type: none"> <li>● To Provide Practical Insights to Participants on Marketing Communications</li> <li>● To Understand the Planning, Implementation, and Evaluation process of Marketing Communication</li> <li>● To Discuss Modern Practices on Promotion with respect to Digital and Online platforms</li> </ul>	<ul style="list-style-type: none"> <li>● The Students will be Equipped with the Practical Elements of Marketing Communication</li> <li>● The Participants will be enabled to understand the Promotion Process through Integrated Marketing Communications</li> <li>● At the end of this Course, the Students may be enabled to handle Integrated Marketing Communications Elements</li> </ul>
<b>SERVICES MARKETING</b>	<ul style="list-style-type: none"> <li>● To provide key insights and working knowledge to participants in marketing of services</li> <li>● To provide the conceptual frame of services marketing</li> <li>● To discuss marketing practices in key service</li> </ul>	<ul style="list-style-type: none"> <li>● The Participants will understand the Role and Importance of Services Sector and the intricacies in Marketing of Services</li> <li>● The Participants will get basic insights into the framework of Services Marketing and how to</li> </ul>

	industries	<p>apply the concepts in Practice</p> <ul style="list-style-type: none"> <li>● At the end of this course Participants are expected to acquire insights into Marketing of Services in different Industries</li> </ul>
<b>TRAINING &amp; DEVELOPMENT</b>	<ul style="list-style-type: none"> <li>● To provide key insights into the HR function of Training and Development</li> <li>● To impart Conceptual base with respect to different types of Training and development Programmes</li> <li>● To discuss Training and Development Practices in Industries</li> </ul>	<ul style="list-style-type: none"> <li>● The Participants will understand the Role and Importance of Training and Development as a HR function</li> <li>● The Students will understand how to Analyse Training requirements in an Organisation</li> <li>● At the end of this Course, the Participants will get and Overview of different types of Training and Development programmes</li> </ul>
<b>PERFORMANCE &amp; TALENT MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To apprise the participants about the importance of Performance Management in Organizations and impart an understanding of the process of managing performance to achieve the organization's current and future objectives.</li> <li>● To give insights on how to identify, integrate &amp; retain talent in an organization to deliver high performance.</li> </ul>	<ul style="list-style-type: none"> <li>● The Participants will understand the Conceptual frame of HR Core Function Performance and Talent Management</li> <li>● At the end of this Course, the Participants will get an understanding of Performance Management Process in Organisations</li> </ul>
<b>SUPPLY CHAIN MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To gain a working understanding of logistics Principles and to expose students to the basic concepts the language of logistics and supply chain management.</li> <li>● To refine applied data analysis skills by analyzing and using supply chain data to evaluate supply chain performance and to make business decisions</li> <li>● To understand current challenges faced by supply chain professionals and to provide a basis for thinking through these challenges</li> </ul>	<ul style="list-style-type: none"> <li>● Acquiring data analysis skills by analyzing and using supply chain data</li> <li>● Ability to undertake supply chain designing</li> </ul>
<b>TOTAL QUALITY MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To familiarize the participants concepts and techniques in Total Quality Management</li> </ul>	<ul style="list-style-type: none"> <li>● Ability to do Quality management practices</li> <li>● Ability to do quality planning activities</li> </ul>

	<ul style="list-style-type: none"> <li>● To develop skills to use Quality control tools and techniques in solving quality problems.</li> </ul>	
<b>E-BUSINESS</b>	<ul style="list-style-type: none"> <li>● This course is aimed at developing an understanding of e-business, with reference to various issues and concerns imperative to implementation of e-business strategies</li> </ul>	<ul style="list-style-type: none"> <li>● Through this Course the students will be able to understand the E-Business Technology</li> <li>● The students will also acquire advanced knowledge of technical and business issues related to E-Business and E-Commerce</li> </ul>
<b>ENTERPRISE RESOURCE PLANNING</b>	<ul style="list-style-type: none"> <li>● To Understand how Enterprise Resource Planning software is used to optimize business processes</li> <li>● To grasp the activities of ERP project management cycle</li> <li>● To understand the emerging trends in ERP developments</li> </ul>	<ul style="list-style-type: none"> <li>● Through this course the students will be able to comprehend the technical aspects of ERP systems</li> <li>● Students will develop a clear and meaningful understanding of the steps and activities in the ERP life cycle</li> <li>● The students will understand the current trends and issues related to Enterprise Systems</li> </ul>
<b>CLOUD COMPUTING</b>	<ul style="list-style-type: none"> <li>● This course is aimed at developing an understanding about the basics of Cloud Computing for Business Management</li> </ul>	<ul style="list-style-type: none"> <li>● Through this course the students will be able to understand the usage of cloud computing in business management</li> <li>● The students will also be able to understand the various cloud computing models and services</li> </ul>
<b>STRATEGIC MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To expose students to various concepts and perspectives in the field of Strategic Management</li> <li>● To help participants develop skills for applying these concepts in various contexts to solve business problems</li> <li>● To enable to students to use traditional and contemporary analytical tools of Strategic Management</li> </ul>	<ul style="list-style-type: none"> <li>● The Participants will be able to understand the concepts and perspectives in the area of Strategic Management</li> <li>● Participants will acquire the necessary skills in using traditional and contemporary Analytical tools of Strategic Management</li> <li>● At the end of the course, Participants will develop the ability to take the right Managerial Decisions and solve Business Problems</li> </ul>
<b>INTERNATIONAL FINANCE &amp; FOREX MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To understand the significance of International Financial Management and operational aspects of foreign exchange markets.</li> <li>● To develop knowledge, capability, and skills necessary for making sound</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to understand economic concepts used for managerial decision making</li> <li>● The participants will get basic insights into demand and supply side of markets</li> <li>● At the end of this course, the</li> </ul>

	<p>investment and financial decisions for a multinational firm</p> <ul style="list-style-type: none"> <li>● To define and measure Forex Risks and to identify risk management strategies.</li> </ul>	<p>participants will get conceptual clarity and logical aspects of economic behavior of individuals, firms and markets.</p> <ul style="list-style-type: none"> <li>● The participants will be able to understand economic concepts used for managerial decision making</li> </ul>
<b>MANAGEMENT OF FINANCIAL SERVICES</b>	<ul style="list-style-type: none"> <li>● To give an appreciation and understanding of the fundamentals of financial services industry in India</li> <li>● To give an insight into the impact of financial services industry in the overall financial system.</li> </ul>	<ul style="list-style-type: none"> <li>● Understand the role and function of the financial system in reference to the macro economy.</li> <li>● Demonstrate an awareness of the current structure and regulation of the Indian financial services sector.</li> <li>● Evaluate and create strategies to promote financial products and services.</li> </ul>
<b>MARKETING RESEARCH</b>	<ul style="list-style-type: none"> <li>● To Provide the Participants Basic Insights into Research Process in Marketing</li> <li>● To Provide the Participants Basic Skills to conduct Marketing Research</li> <li>● To make the Participants aware the Role and Importance of Research in Marketing</li> </ul>	<ul style="list-style-type: none"> <li>● The participants will be able to understand the framework of Marketing Research</li> <li>● The participants will get basic insights into Applications of Marketing Research</li> <li>● At the end of this course, the participants will get basic knowledge on various tools of Marketing Research</li> </ul>
<b>COUNSELING SKILLS FOR MANAGERS</b>	<ul style="list-style-type: none"> <li>● To Provide a clear understanding about the Concepts, Methods, Techniques and Issues involved in Counseling as a HR Function</li> <li>● To Impart basic skills in Counseling to the Participants</li> </ul>	<ul style="list-style-type: none"> <li>● The Participants will get an overview on Counseling and its nuances</li> <li>● The Participants may gain insights into the Processes and Procedures involved in Counseling</li> </ul>
<b>LEADERSHIP FOR MANAGERIAL PERFORMANCE</b>	<ul style="list-style-type: none"> <li>● To Examine and Analyse various Approaches and Theories of Leadership and its Role in Managerial Performance</li> <li>● To Discuss the issues related to Leadership in the context of Management Profession</li> </ul>	<ul style="list-style-type: none"> <li>● The Participants will understand about Leadership Approaches and Styles and the Role of Effective Leadership in Organisations</li> <li>● The Participants will be able to comprehend the Issues related to Leadership and the Status of Women Leadership</li> </ul>
<b>MATERIALS AND PURCHASE MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To familiarize the participants concepts and techniques of Materials Management</li> </ul>	<ul style="list-style-type: none"> <li>● Acquiring Purchasing and Material Planning skills</li> <li>● Ability to conduct stores auditing</li> </ul>

	<ul style="list-style-type: none"> <li>● Provide an understanding to the advanced concepts and practices in Purchasing and Material Planning</li> </ul>	
<b>MAINTENANCE MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To familiarize the participants concepts and techniques of Materials Management</li> <li>● Provide an understanding to the advanced concepts and practices in Purchasing and Material Planning</li> </ul>	<ul style="list-style-type: none"> <li>● Ability to manage inventories</li> <li>● Ability to develop skills in purchasing and managing stores</li> </ul>
<b>INFORMATION SECURITY MANAGEMENT</b>	<ul style="list-style-type: none"> <li>● To identify and discuss the benefits of implementing an information security management system in an organization.</li> <li>● Be able to identify assets and threats, and assess risks.</li> <li>● To plan and implement a ISMS in an organization.</li> </ul>	<ul style="list-style-type: none"> <li>● Through this course the students will be able to understand the importance of information security management in an organisation.</li> <li>● The students will also be able to understand the various information security threats and ways to manage it.</li> </ul>
<b>E-BUSINESS STRATEGY</b>	<ul style="list-style-type: none"> <li>● To describe and evaluate predominant e-business models and strategies as well as to describe activities involved in formulating and implementing e-business strategies.</li> <li>● To describe the challenges and business opportunities of mobile commerce and social networks.</li> <li>● To develop strategic plan for e-business initiatives.</li> </ul>	<ul style="list-style-type: none"> <li>● Through this course the students will be able to understand various e-business models and strategies</li> <li>● The course will also equip the students to formulate and implement the E-Business strategies in an organisation</li> </ul>

# **MACFAST**

## **DEPARTMENT OF COMPUTER APPLICATIONS**

### **Programme Outcomes / Programme Specific Outcomes / Course Outcome for all programmes offered by the institution**

#### **PROGRAMME OUTCOME MASTERS OF COMPUTER APPLICATIONS**

.The department offers a two year Lateral Entry/three-year Master of Computer Applications degree programme approved by AICTE and affiliated to the M.G. University Kottayam, both having an intake capacity of 60 students each. The objective of this course is to mould eminent professionals with creative minds and sound practical skills in cutting edge technologies to confront the challenging demands of the world of science & technology. Striving to strike a balance between theory and practice, we offer a unique synthesis of world-class teaching coupled with collaborative learning opportunities and industrial interactions for students to shape them into top-notch professionals.

#### **Objectives**

- Mould eminent professionals with creative minds, innovative ideas and sound practical skills.
- To continually improve the teaching – learning processes, by keeping abreast of latest cutting edge technologies.
- Provide an environment for students to gain expertise in theoretical foundations of computer applications with emphasis on strong practical training that will enable them to develop real world applications catering to the global needs.
- To nurture student's ability to analyze, design and solve issues in the areas of computing.
- Instill Entrepreneurial collaborative thinking through structured interventions and industry participation.

#### **PROGRAMME SPECIFIC OUTCOME**

## **MCA 3 YEAR REGULAR ENTRY PROGRAMME**

The MCA Regular Entry Course is a 3 year duration programme that is designed to prepare students who will be successful professionals in industry, academia, research, entrepreneurial pursuit. This course focuses on the areas of Application Software Development, Computer Networks, Web Design & Development, Data Mining and more. The programme has been carefully designed with a focus on delivering the latest, industry-oriented education in computer applications with a sound theoretical and practical approach to learning. The course has a broad- based technical foundation in the areas of Computer Science, Mathematics and Management

## **MCA 2 YEAR LATERAL ENTRY PROGRAMME**

The MCA Lateral entry Course is a 2 year duration programme that is designed to prepare students who will be successful professionals in industry, academia, research, entrepreneurial pursuit. This course focuses on the areas of Application Software Development, Computer Networks, Web Design & Development, Data Mining and more. The programme has been carefully designed with a focus on delivering the latest, industry-oriented education in computer applications with a sound theoretical and practical approach to learning.

## **COURSE OUTCOME OF MCA REGULAR**

<b>FIRST SEMESTER</b>	
<b>Course</b>	<b>Outcomes</b>
MCA101T Discrete Mathematics and Statistics	Discrete Mathematics explains the fundamental concepts in mathematics. It can be used by the students in computer science as an introduction to the underlying ideas of mathematics for computer science. It explains topics like mathematical logic, predicates, relations, functions, combinatorics, algebraic structures, recurrence relations and graph theory  Probability and Statistics is a subject which helps the students to describe events that do not occur with certainty and make good decisions about uncertain situations.
MCA102T Fundamentals of Data Structures	Students develop knowledge of basic data structures for storage and retrieval of ordered or unordered data. Data structures include: arrays, linked lists, binary trees, heaps, and hash tables.



MCA103T Paradigms of Programming Languages	Different approaches to programming: functional and logic paradigms. Fundamental concepts of programming languages, including abstraction, binding, parameter passing, scope, control abstractions.
MCA104T Digital Systems & Computer Architecture	Ability to understand basic structure of computer, to perform computer arithmetic operations. Ability to design memory organization that uses banks for different word size operations. To conceptualize the basics of organizational and architectural issues of a digital computer
MCA105T Problem Solving and Programming in C	The course is designed to provide complete knowledge of C Language. Students will be able to develop logics which will help them to create programs, applications in C. Also by learning the basic programming constructs they can easily switch over to any other language in future.
MCA106P C practicals	The course aims to provide exposure to problem solving through programming. It aims to train the students the basic concepts of C-programming language. The practical sessions are designed to give the students hands-on experience with the concepts.
MCA107P Data Structures through C - practicals	The course is designed to develop skills to design and analyze simple linear and nonlinear data structures. It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem. It enables them to gain knowledge in practical applications of data structures
MCA108T English for Professional Communication	The main goal of the course is to help the students improve spoken English skills to enable them to communicate more effectively in English. The language skills necessary for effective communication include intelligible pronunciation, stress, listening comprehension skills, vocabulary

	beyond that of the subject matter, control of English grammar, paraphrasing and elaboration skills, coherent organization of information at sentence and discourse levels and interactive skills to enhance comprehension.
<b>SECOND SEMESTER</b>	
MCA201T Optimization Techniques & Numerical Methods	Students need to have a solid intuitive understanding of how and why optimization methods work. This enables them to recognize when things have gone wrong, and to diagnose the source of the difficulty and take appropriate action. It also permits students to see how methods can be combined or modified to solve non-standard problems.
MCA202T Operating Systems	To understand and analyse theory and implementation of: processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and file
MCA203T Database Management Systems	At the completion of this course, students should be able to understand the role of a database management system in an organization, basic database concepts, including the structure and operation of the relational data model, Construct simple and moderately advanced database queries using Structured Query Language(SQL) and successfully apply logical database design Principles, including E-R diagrams and database normalization.
MCA204T Data Communications & Networks	This course is to provide students with an overview of the concepts and fundamentals of data communication and computer networks. Topics to be covered include: data communication concepts and techniques in a layered network architecture, communications switching and routing, types of

	communication, network congestion, network topologies, network configuration and management, network model components, layered network models (OSI reference model, TCP/IP networking architecture) and their protocols, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols
MCA205T Web Technologies	To get in-depth knowledge in web related technologies such as HTML, CSS,XML,JAVA Script,JSP,RUBY,Dotnet Frameworks etc.
MCA206P DBMS practical's	To get hands-on experience on advanced database queries using Structured Query Language(SQL)
MCA207P Web Technologies practical's	To get hands-on experience on HTML,CSS,XML,JAVA Script,JSP, etc
<b>THIRD SEMESTER</b>	
MCA301T Principles of Management & Accounting	This course will enable the students to get awareness regarding organizational practices and principles and hence will help in getting them equipped with organizational & corporate work culture. It also assists in creating awareness regarding different functions performed by various management levels/ departments.
MCA302T Analysis & Design of Algorithms	Provides a detailed study of algorithms and Design.
MCA303T Object Oriented Programming through Java	Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc
MCA304T Software Engineering & Project Management	Discuss software development techniques and methodologies

MCA305T Object Oriented Analysis & Design	Students should: be able to use an object-oriented method for analysis and design. be able to analyse information systems in real-world settings and to conduct methods such as interviews and observations.
MCA306P PHP Programming practical's	To familiarize students with the PHP programming concept and enables them to execute all the programs in lab.
MCA307P OOPS through Java practical's	To inculcate knowledge on Java Programming concepts
<b>FOURTH SEMESTER</b>	
MCA401T System Software	To understand the different type of system software, its working principles and design aspects
MCA402T Data Mining	Understand data mining principles and techniques: Introduce DM as a cutting edge business intelligence method and acquaint the students with the DM techniques for building competitive advantage through proactive analysis, predictive modeling, and identifying new trends and behaviors.
MCA403T TCP/IP Protocols	This course is to provide students with an overview of the concepts and fundamentals of data communication and computer networks. Topics to be covered include: data communication concepts and techniques in a layered network architecture, communications switching and routing, types of communication, network congestion, network topologies, network configuration and management, network model components, layered network models (OSI reference model, TCP/IP networking architecture) and their protocols, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols.

MCA404T Linux OS and Shell programming	The course introduces basic understanding of UNIX OS, UNIX commands and File system and to familiarize students with the Linux environment. To make students learn the fundamentals of shell scripting and shell programming. Emphases are on making student familiar with UNIX environment and issues related to it.
MCA405E Big Data	Understand the key issues in big data management and its associated applications in intelligent business and scientific computing. Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics
MCA406P Linux OS & Shell programming Practical	Hands-on experience of UNIX OS, UNIX commands and File system and to familiarize students with the Linux environment
MCA407D Mini Project-Application Development	The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
<b>FIFTH SEMESTER</b>	
MCA501T User Interface Design	understand what interaction design is, the importance of user-centered design and methods of user information gathering
MCA502T Knowledge Management & Business Intelligence	The objective of the course is to prepare students to understand the current theories, practices, tools and techniques in knowledge management to deal with the challenges with the organization and management of knowledge. This helps to solve most of the common business problems and helps companies increase their benefits. Business Intelligence is the method of using the knowledge of the impel tools and rigging to propel the business prevent the data distortion and accumulate it at the same time.

	Knowledge Management and Business Intelligence aims in creating creative knowledge developers to compete with the emerging challenges.
MCA503T Enterprise Resource Planning	To understand the basic structure of ERP, and to apply design principles for various business modules in ERP
MCA504T Advanced Java Programming	To know networking concepts with respect to java domain, and to study advanced concepts related to RMI, CORBA, EJB, Stream Concepts, JSP, JDBC and Servlet Concepts.
MCA505E ADHOC And Sensor networks	To know the constraints of the wireless physical layer that affect the design and performance of ad hoc and sensor networks, protocols and applications.  To understand MAC, Routing protocols that have been proposed for ad hoc and sensor networks.
MCA506P Advanced Java Programming practical	To get hands-on experience on advanced concepts in java related to networking domain
MCA507P Python Programming - practical	The course is designed to provide basic knowledge of Python. Python Programming is intended for software engineers, system analysts, programme managers and user support personnel who wish to learn the Python programming language.
MCA508S Main Seminar – Current Trends	The objective of Main Seminar is to help develop the students' simple yet powerful strategies and skills. Students may gain a better insight into the subject. Prepares the students to obtain up positions as system analysts, system designers and programmers in any field related to information technology.

**SIXTH SEMESTER**

<p>MCA601D Project</p>	<p>The objective of the MCA project work is to develop quality software solution. During the development of the project, the student should involve in all the stages of the software development life cycle like requirements engineering, systems analysis, systems design, software development, testing strategies and documentation with an overall emphasis on the development of reliable software systems. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices, so as to participate and manage a large software engineering projects in future.</p>
<p>MCA602V Viva-voce</p>	<p>Students will be evaluated through all core subjects of the MCA programme and marks will be awarded on the basis of oral answers given by the students</p>

## **COURSE OUTCOME OF MCA LATERAL ENTRY**

<b>THIRD SEMESTER</b>	
<p>MCA301T Principles of Management &amp; Accounting</p>	<p>This course will enable the students to get awareness regarding organizational practices and principles and hence will help in getting them equipped with organizational &amp; corporate work culture. It also assists in creating awareness regarding different functions performed by various management levels/ departments.</p>
<p>MCA302T Analysis &amp; Design of Algorithms</p>	<p>Provides a detailed study of algorithms and Design.</p>
<p>MCA303T Object Oriented Programming through Java</p>	<p>Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc</p>

MCA304T Software Engineering & Project Management	Discuss software development techniques and methodologies
MCA305T Object Oriented Analysis & Design	Students should: be able to use an object-oriented method for analysis and design. be able to analyse information systems in real-world settings and to conduct methods such as interviews and observations.
MCA306P PHP Programming practical's	To familiarize students with the PHP programming concept and enables them to execute all the programs in lab.
MCA307P OOPS through Java practical's	To inculcate knowledge on Java Programming concepts
<b>FOURTH SEMESTER</b>	
MCA401T System Software	To understand the different type of system software, its working principles and design aspects
MCA402T Data Mining	Understand data mining principles and techniques: Introduce DM as a cutting edge business intelligence method and acquaint the students with the DM techniques for building competitive advantage through proactive analysis, predictive modeling, and identifying new trends and behaviors.
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	networks) and their protocols.
MCA404T Linux OS and Shell programming	The course introduces basic understanding of UNIX OS, UNIX commands and File system and to familiarize students with the Linux environment. To make students learn the fundamentals of shell scripting and shell programming. Emphases are on making student familiar with UNIX environment and issues related to it.
MCA405E Big Data	Understand the key issues in big data management and its associated applications in intelligent business and scientific computing. Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics
MCA406P Linux OS & Shell programming Practical	Hands-on experience of UNIX OS, UNIX commands and File system and to familiarize students with the Linux environment
MCA407D Mini Project-Application Development	The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
<b>FIFTH SEMESTER</b>	
MCA501T User Interface Design	understand what interaction design is, the importance of user-centered design and methods of user information gathering
MCA502T Knowledge Management & Business Intelligence	The objective of the course is to prepare students to understand the current theories, practices, tools and techniques in knowledge management to deal with the challenges with the organization and management of knowledge. This helps to solve most of the common business problems and helps companies increase their benefits. Business Intelligence is the method of using the knowledge of the impel tools and rigging to propel the business prevent the data

	distortion and accumulate it at the same time. Knowledge Management and Business Intelligence aims in creating creative knowledge developers to compete with the emerging challenges.
MCA503T Enterprise Resource Planning	To understand the basic structure of ERP, and to apply design principles for various business modules in ERP
MCA504T Advanced Java Programming	To know networking concepts with respect to java domain, and to study advanced concepts related to RMI, CORBA, EJB, Stream Concepts, JSP, JDBC and Servlet Concepts.
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MCA508S Main Seminar – Current Trends	The objective of Main Seminar is to help develop the students' simple yet powerful strategies and skills. Students may gain a better insight into the subject. Prepares the students to obtain up positions as system analysts, system designers and programmers in any field related to information technology.
<b>SIXTH SEMESTER</b>	

<p>MCA601D Project</p>	<p>The objective of the MCA project work is to develop quality software solution. During the development of the project, the student should involve in all the stages of the software development life cycle like requirements engineering, systems analysis, systems design, software development, testing strategies and documentation with an overall emphasis on the development of reliable software systems. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices, so as to participate and manage a large software engineering projects in future.</p>
<p>MCA602V Viva-voce</p>	<p>Students will be evaluated through all core subjects of the MCA programme and marks will be awarded on the basis of oral answers given by the students</p>

**MAR ATHANASIOS COLLEGE FOR ADVANCED STUDIES TIRUVALLA**  
**DEPARTMENT OF BIOSCIENCES**  
**Programme Outcomes/Programme Specific Outcomes/Course Outcome for all**  
**programmes offered by the institution**

<b>SCHOOL OF BIOSCIENCES</b>	
<p><b>MSc Degree Programme</b> is a 2 year Post Graduate Programme. The programme is under the Credit Semester Scheme, consisting of four semesters spread over a period of two years. The programme and syllabus is in compliance with the UGC minimum standards for the conduct and award of post graduate degree.</p>	
<b>PROGRAMME OUTCOMES</b>	
<b>MSc Biotechnology</b>	<ul style="list-style-type: none"> <li>• Objective of this course is to understanding various disciplines in biotechnology; acquire methodological knowledge in them and application of this knowledge in a suitable manner in required fields.</li> <li>• Nurturing novel ideas and meaningful insights through scientific thinking.</li> <li>• Enabling critical analysis of problems and situations to reach solutions.</li> <li>• Development of communication skills to present scientific data in oral and written formats.</li> <li>• Providing a platform for individual and collective work.</li> <li>• Understanding the significance of sustainable scientific processes to support the environment.</li> </ul>
<b>MSc Biochemistry</b>	<ul style="list-style-type: none"> <li>• The M.Sc. Degree programme aims at providing an in-depth understanding of the core principles of Biochemistry and their experimental aspects.</li> <li>• The students get an overview of the recent trends, and will be able to annex updated information to their knowledge base.</li> <li>• This programme also aims a study on some of the emerging areas of Bioscience.</li> </ul>
<b>MSc Plant Biotechnology</b>	<ul style="list-style-type: none"> <li>• The aim of the programme is to highlight the role played by Biotechnology in modern society and its relevance to sustainable development.</li> <li>• It seeks to advance education and research in Plant Biotechnology and</li> </ul>

	<p>explore sustainable solutions for agriculture, environment and energy sectors.</p>
<b>MSc Bioinformatics</b>	<ul style="list-style-type: none"> <li>• Nurturing novel ideas and meaningful insights through scientific thinking.</li> <li>• Enabling critical analysis of problems and situations to reach solutions.</li> <li>• Development of communication skills to present scientific data in oral and written formats.</li> <li>• Providing a platform for individual and collective work.</li> <li>• Understanding the significance of sustainable scientific processes to support the environment.</li> </ul>
<b>MSc Phytomedical science and Technology</b>	<ul style="list-style-type: none"> <li>• The program aims to train students in the methods used to analyse and characterise medicinal natural products.</li> <li>• Examine the safety and efficacy of currently used herbal medicines.</li> <li>• To attain expertise in analytical and bioassay methods and the ethno pharmaceutical uses of plants from traditional systems of medicine.</li> </ul>
<b>MSc Food Technology and Quality Assurance</b>	<ul style="list-style-type: none"> <li>• The M.Sc program aims to enable the graduate to acquire the scientific, technical and professional skills for teaching/research/executive career in the food industry/food research and teaching institutions.</li> <li>• It provides an understanding of science of food technology together with a deeper comprehension of food quality assurance.</li> </ul>
<b>PROGRAMME SPECIFIC OUTCOME</b>	
<b>MSc Biotechnology</b>	<ul style="list-style-type: none"> <li>• Imparting basic knowledge in interdisciplinary fields of biotechnology.</li> <li>• Using modern tools to study and analyse biological data</li> <li>• To equip the candidates to meet the demands of the society and develop sustainable products and processes through biotechnology.</li> <li>• To be aware of the ethical issues, personal and environmental safety during biotechnology practices.</li> <li>• Promoting scientific discoveries and familiarizing research methodology through implementation of projects.</li> </ul>

<p><b>MSc Biochemistry</b></p>	<ul style="list-style-type: none"> <li>• Structure function relationships, interaction between macromolecules and cellular processes at the molecular level.</li> <li>• Tools and techniques used in biological analysis.</li> <li>• Metabolic pathways, clinical aspects, Energetics and Catalysis.</li> <li>• It deals with various techniques in genetic engineering, tissue culture, pharmacology, toxicology and nanobiology.</li> <li>• Research methodology, Legal rights of intellectual activity, problems and ethical issues related to Bioscience research.</li> </ul>
<p><b>MSc Plant Biotechnology</b></p>	<ul style="list-style-type: none"> <li>• Students will be able to recall the basic concepts of Biotechnology and explain fundamental cellular events during the process of plant cell culture development.</li> <li>• The students will be able to determine the factors affecting cell differentiation and thereby execute proper techniques/procedures for the maintenance of sterile conditions and proper plant growth.</li> <li>• Upon completion of program, students will be able to translate the concepts in future studies and debate on the issue related to GMOs and evaluate its significances</li> <li>• Students will be able to differentiate various types of intellectual property rights and report measures for conservation of biodiversity</li> <li>• Students will be able to design an experiment with step-by-step instructions to address a research problem.</li> </ul>
<p><b>MSc Bioinformatics</b></p>	<ul style="list-style-type: none"> <li>• The programme aims to utilize and understand biological databases.</li> <li>• Gathering, storage, analysis and integration of biological data for generating new knowledge.</li> <li>• Developing and implementing computational algorithms and software for the better understanding of dynamic biological processes.</li> <li>• Understanding the biological processes at molecular level.</li> <li>• To know the ethical practices in bioinformatics and related fields.</li> </ul>
<p><b>MSc Phytomedical Science and Technology</b></p>	<ul style="list-style-type: none"> <li>• The students will be able to apply biotechnology in medicinal and aromatic</li> </ul>

	<p>plants for regeneration and propagation of existing and endangered species</p> <ul style="list-style-type: none"> <li>• The program aims at developing qualified Human resource for research and development, sustainable management of medicinal and aromatic plants for a holistic and integrated health care system, apart from contributing to the sectors of natural dyes and health tourism.</li> <li>• Upon the completion of the program students will be able to imply scientific and technological advances in the field of plant protection, considering the requirements of conventional plant protection as well of those of organic farming</li> </ul>
<b>MSc Food Technology and Quality Assurance</b>	<ul style="list-style-type: none"> <li>• Knowledge and competence in the principles of quality assurance and quality management system as they are applied in the food production and distribution to produce safe food, meeting quality and legal standard.</li> <li>• Thorough knowledge of chemical, biological and physical principles which underlie food processing, package and storage.</li> <li>• Ability to apply the principles of chemical analysis, microbiological and statistical control techniques to analyze and assure the quality and safety of food.</li> <li>• Capacity to undertake research leading to new product development.</li> <li>• Capacity for critical evaluation, presentation and interpersonal communication skills.</li> </ul>
<b>COURSE OUTCOME</b>	
<b>MSc BIOTECHNOLOGY</b>	
<b>FIRST SEMESTER</b>	
<b>Course</b>	<b>Outcome</b>
<b>BT020101</b> General biochemistry	The student is exposed to the biochemical composition of the cell. The structure and types of nutrient components. The major metabolic pathways and their significance. The coordination of metabolic pathways.

<p><b>BT020102</b> Cell biology and genetics</p>	<p>The student can understand how the cell is equipped with machineries to conduct activities as the basic structural and functional unit of life. The structural features of cell organelles/machineries. The functional mechanisms of cellular phenomena. The fundamental principles of heredity and deviations from mendelian behaviour. The effect of mutations and mutational analysis. Principles of behavioural and population genetics.</p>
<p><b>BT020103</b> Instrumentation and Biostatistics</p>	<p>The student gets an awareness in the techniques used in the visualization of cellular components and macromolecules. Analytical techniques used in detection and quantification of biological compounds and the separation techniques used in biology. The application of statistical principles in biological studies. The research methodology and documentation.</p>
<p><b>BT020104</b> Biophysics and Bioinformatics</p>	<p>An exposure is given to students in bioenergetics of cell and the basic architecture of macromolecules. The interaction between macromolecules. The role of bioinformatics in biological data storage. The applications of bioinformatics tools in analysing biological data.</p>
<p><b>BT020105</b> Lab course I</p>	<p>The students are able to understand the basic principles of preparation of solutions, the detection, assay and purification of biological compounds.</p>
<p><b>SECOND SEMESTER</b></p>	
<p><b>BT020201</b> Microbiology</p>	<p>The students get an exposure in microbial grouping and its taxonomical significance. Cultivation and identification of microorganisms. Tools and techniques used in microbiology. Microbial metabolism and molecular processes.</p>
<p><b>BT020202</b> Immunology</p>	<p>The students have knowledge of the cells and organs associated with immune system. The details of immune system functioning. Analytical techniques based on immunological reactions. The after effects of defects in immune system.</p>
<p><b>BT020203</b> Molecular biology</p>	<p>The student gets a comprehensive knowledge of the structural and functional organization of genome. The molecular phenomena of DNA copying and transmission of information. The regulation of gene functions and associated phenomena.</p>



<p><b>BT020204</b> Enzymology and metabolism</p>	<p>The students are able to understand the major pathways of intermediary metabolism and discuss their energetics. Correlate the metabolic activity of tissues and organs with their function. Describe structure, functions and mechanism of action of enzymes. Understand kinetics, inhibition and regulation of enzyme catalysed reactions.</p>
<p><b>BT020205</b> Lab course II</p>	<p>The student can learn the cultivation, observation and identification of microorganisms. The design of immunological experiments. The detection of compounds of interest in biological samples.</p>
<p><b>THIRD SEMESTER</b></p>	
<p><b>BT020301</b> Bioprocess Technology</p>	<p>The students are trained in screening for microbial strains from different samples. Types of Bioprocess and standard lab practices. Bioreactor designing and control. Industrial production conditions through fermentation</p>
<p><b>BT020302</b> Recombinant DNA Technology</p>	<p>The student is exposed to the basic requirements to perform genetic engineering experiments. The techniques involved in the preparation and introduction of rDNA to the host. Applications of rDNA technology. Regulations in carrying out rDNA experiments.</p>
<p><b>BT020303</b> Environmental biotechnology</p>	<p>The student is able to understand the role of biotechnology in environmental applications. Degradation of recalcitrant compounds by biological agents. Treatment technologies involved in the processing of solid and liquid waste. Alternate green energy sources and green technologies.</p>
<p><b>BT020304</b> Plant and Animal biotechnology</p>	<p>Students get familiarized with the fundamental requirements and design of lab to carry out plant and animal cell culture experiments. The different approaches and techniques involved in creating recombinant plant and animals. The applications and demerits of genetic modification in plants and animals.</p>
<p><b>BT020305</b> Lab Course III</p>	<p>Students are trained in characterising waste water, bacteriological analysis of water and food, plant tissue culture techniques and other lab scale bioprocesses.</p>

<b>FOURTH SEMESTER</b>	
<b>Elective Group 1</b>	
<b>BT830401</b> Environment and Biotechnology	Students can understand the structure of the environment, the global environmental issues, the necessity to conserve environment and strategies for conservation and the biotechnological approaches in environmental studies.
<b>BT830402</b> Food biotechnology	Students can understand applications of biotechnology in food production. Enhancing the quality and quantity of food materials through genetic engineering, The rules and regulations in genetic modification of food.
<b>BT830403</b> Advanced Molecular Techniques	The students become familiar with the principles and the applications of current advanced molecular techniques and methods. Recognize the difference between various molecular techniques as well as their strength and limitations
<b>Elective Group II</b>	
<b>BT840401</b> Physiology and Biotechnology	The students become familiar with the functional significance of organ systems. Role of plant metabolic pathways and their steps. Applications of biotechnology in human cell and organ culture.
<b>BT830402</b> Microbial Food Technology	The students will be able to understand the role of microbial fermentation in food production and factors affecting it. Role of biotechnology in food production and modification.
<b>BT840403</b> IPR & biotechnology	The students will be able to understand intellectual property and its different forms. The National and international approaches to protect the IPR. The guidelines for biosafety. Genetic modification of food crops and animals and the ethical issues.
<b>Elective Group III</b>	
<b>BT850401</b> Molecular biology of Development	The students are exposed to the cellular processes leading to organogenesis and development. Significance of molecular patterns and molecular mechanisms of development in plants and animals. Basic mechanism of senescence and cell death.

<b>BT850402</b> Cancer biology	The students are able to understand basic aspects of cancer pathology. Mechanisms of Carcinogenesis and metastasis. Diagnostic techniques and treatment approaches.
<b>BT850403</b> Genomics: Techniques and Applications	The student will be aware of the structural and functional organization of genome. Human genomic structure and implications of HGP. Techniques involved in genomics and their applications.
<b>BT020401</b> Lab Course	Students are trained in isolation of genetic material, purification. Modification of genetic material, generation and introduction of r DNA, analysis of genome.
<b>BT020402</b> Project and Dissertation	Students will get an opportunity to show the necessary skills and knowledge in order to organise and conduct a research project.
<b>BT020403</b> Comprehensive viva voce	A comprehensive viva-voce will be held at the end of the fourth semester covering all the courses of the Programme taught in the entire four semesters. Students will be evaluated through all core subjects and grade will be awarded on the basis of oral answers given by the students

### **MSc BIOCHEMISTRY**

#### **FIRST SEMESTER**

<b>Course</b>	<b>Outcome</b>
<b>BC010101</b> <b>Biomolecules and Structural Biology</b>	To understand the basic concepts of biomolecules, analyse the structural and functional relationship of biomolecules and know about the interactions between macromolecules.
<b>BC010102</b> <b>Analytical Biochemistry and Bioinformatics</b>	To understand the biochemical techniques used in research and industry, handle various instruments used in laboratories, demonstrate the insilico tools for biological data analysis and understand the significance and precautions to be taken during radioactivity experiments.
<b>BC010103</b> <b>Cell Biology and Genetics</b>	Understand the various organelles of a cell and its functions. Know about the different cellular receptors and signal transduction pathways. Understand the etiology of cancer. Aware of the genetic aspects of inheritance.

<b>BC010104</b> <b>Human Physiology and Biostatistics</b>	Understand the tissues and organs of the human body. Demonstrate the ability to differentiate physiology from the cellular and molecular level to the organ system. Evaluate laboratory experiments in physiology. Appraise the role of statistics in research
<b>BC010105</b> <b>Laboratory course I</b>	The students are able to understand the basic principles of preparation of solutions, the detection, assay and qualitative analysis.
<b>SECOND SEMESTER</b>	
<b>BC010201</b> <b>Metabolism and Bioenergetics</b>	To define the major pathways of intermediary metabolism and discuss their energetics, physiological adaptation, regulation, localization and cellular compartmentalization, correlate the metabolic activity of tissues and organs with their function and discuss how derangements in metabolism leads to diseases.
<b>BC010202</b> <b>Molecular Biology &amp; Genetic Engineering</b>	Understand the molecular mechanisms underlying the transmission of genetic information. Realise the different molecular tools and strategies in practice in genetic engineering. Appreciate the applications of rDNA technology in various fields.
<b>BC010203</b> <b>Immunology</b>	Conceptualize cellular and molecular basis of the immune system. Understand how the innate and adaptive immune responses coordinate to fight against invading pathogens. Appreciate the structure and functions of MHC molecules and Immunoglobulins. Understand the complement system, its activation and biological consequences of complement activation. Differentiate between the types of antigen-antibody interaction and the different immunological assays based on the interaction. Understand about the vaccines in use and the strategies to develop vaccines of the future. Understand and identify the genetic defects that lead to immunodeficiency diseases and their treatment as well as the current status of gene therapy.
<b>BC010204</b> <b>General Microbiology</b>	Understand the diversity of microbial world and their interactions with the environment. Know about the genetic materials and different genetic mechanisms in bacteria and their role in the transmission of characters. Emphasize the importance of sterilization and disinfection and the methods used in a microbiology laboratory and premises. Categorise microorganisms based on their characteristics.

<b>BC010205</b> <b>Laboratory course II</b>	The student can learn the cultivation, observation and identification of microorganisms. The design of immunological experiments. The detection of compounds of interest in biological samples. Students are trained in isolation of genetic material and purification.
<b>THIRD SEMESTER</b>	
<b>BC010301</b> <b>Enzymology</b>	To describe structure, functions and mechanism of action of enzymes, classify enzymes based on the reactions catalysed and understand kinetics, inhibition and regulation of enzyme catalysed reactions.
<b>BC010302</b> <b>Plant Biochemistry</b>	To evaluate the phytoconstituents and their application in drug development, know about phytohormones and its applications in agriculture, understand the applications of plant lectins in the purification of glycans and know how plants survive stress conditions and climate change.
<b>BC010303</b> <b>Molecular Endocrinology</b>	To understand the different cellular signals and regulation of metabolic activities, understand the mechanism of action of hormones, different types of receptors and analyze cellular mechanism of hormonal control in diseased condition.
<b>BC800301</b> <b>Neurobiochemistry</b>	To understand neurons and their functions, understand the role of neurotransmitters in health and disease and create an in-depth knowledge of neurodegenerative diseases.
<b>BC810301</b> <b>Biochemical Toxicology</b>	To understand the basic concepts in toxicology and the mechanisms of drug interaction and understand the methods of toxicity studies, symptoms and treatment during poisoning.
<b>BC820301</b> <b>Pharmacological Biochemistry</b>	To understand the scope of pharmacology and the route of administration of drugs: the principles of drug absorption, distribution, metabolism and excretion, understand the pharmacokinetics of drugs with the molecular mechanisms of drug action including drug receptor interactions and describe drug designing and development.

<b>BC010304</b> <b>Laboratory course III</b>	To develop skills of performing basic biochemical tests important in clinical investigations, to develop familiarity with biochemical laboratory techniques, and to introduce students to various practical aspects of enzymology and their correlation in disease conditions
<b>FOURTH SEMESTER</b>	
<b>BC010401</b> <b>Clinical Biochemistry</b>	To understand the inborn errors of metabolism, in-depth, analysis, evaluation and interpretation the common result patterns in routine clinical biochemistry, understand the importance of quality control in clinical laboratories and evaluate the various molecular markers in the diagnosis of diseases.
<b>BC800402</b> <b>Nutritional Biochemistry</b>	To understand the concept of 'nutrition' and the important nutrients and describe the causes symptoms and management of lifestyle diseases.
<b>BC810402</b> <b>Research Methodology, IPR and Bioethics</b>	Be familiar with the different types and methods of research and how to present scientific data. Be aware of legal rights of intellectual activity in the industrial, scientific, literary and artistic fields. To realise the problems and ethical issues related to Bioscience research.
<b>BC820402</b> <b>Genomics and Proteomics</b>	To get an overview of genome variation in population and technologies to detect these variations. Understand how High-throughput DNA sequencing (HTS) can be used to identify disease causing genetic variants in monogenic diseases. Understand the application of various Omics technologies in disease diagnosis. Understand the importance of bioinformatics tools in proteomics and genomic studies.
<b>BC800403</b> <b>Plant and Animal Cell Culture</b>	To understand the basics of plant and animal cell culture, describe sources, selection, potential manipulations and challenges of using stem cells for tissue engineering and identify the key challenges in gene editing technology.

<b>BC810403</b> <b>Nanobiology</b>	Analyse cutting edge concepts and technologies of nanotechnology in the field of Biology. Discuss different tools and techniques that are being used in the field, and where these technologies are heading to. Understand about the applications of nanobiology in the emerging areas such as Nano-medicine, Bio-mimicry to create Nano-materials, and Nano-biotechnology. Gain an insight into the ethical issues that are associated with the study of nanoscience, its role in law and policy making.
<b>BC820403</b> <b>Ecology and Environmental Biochemistry</b>	Understand the ecological homeostasis. Analyse and explain current threats to the environment by pollution and the technological solutions leading to sustainable environment. Be aware of environmental policies.
<b>BC010402</b> <b>Laboratory course IV</b>	The student will be able to clinically assess the laboratory indicators of physiologic conditions and diseases.
<b>BC010403</b> <b>Project</b>	Students will get an opportunity to show the necessary skills and knowledge in order to organise and conduct a research project.
<b>BC010404</b> <b>Viva Voce</b>	A comprehensive viva-voce will be held at the end of the fourth semester covering all the courses of the Programme taught in the entire four semesters. Students will be evaluated through all core subjects and grade will be awarded on the basis of oral answers given by the students
<b>MSc PLANT BIOTECHNOLOGY</b>	
<b>FIRST SEMESTER</b>	
<b>Course</b>	<b>Outcome</b>
<b>BS010101</b> <b>Biochemistry and Cell Biology</b>	The course is designed to give a basic understanding of the chemical makeup of the cell and the different mechanisms in a cell which makes life possible.
<b>BS010102</b> <b>Microbiology and Immunology</b>	The course is designed to introduce the students to different groups of microorganisms, their structure, important chemical constituents, life cycle and significance of their interaction with environment, and various microbial culture methods. Aims to provide understanding in the basics of immunology, molecules involved, mechanisms and methods.

<b>BS010103</b> <b>Genetics and Molecular Biology</b>	<p>Course is designed to make the student understand the fundamentals of Mendelian and post Mendelian Genetics apart from population and developmental genetics. Also the course aims to impart an understanding in replication, transcription and translation with special emphasis on RNA biology.</p>
<b>BS010104</b> <b>Bioanalytical Techniques and Bioinformatics</b>	<p>The course aims to introduce the student to various analytical instruments used in biological and related experiments and to make her/him understand the basic principles of these techniques. Additionally the course introduces the student into the fundamentals of bioinformatics, its applications and basic tools.</p>
<b>BS010105</b> <b>Laboratory course I</b>	<p>The course aims to provide the student basic practical experience in analysis and estimation of different macromolecules, solution preparation, in culture, isolation and identification of microbes, in immunology and enzymology and in basic bioinformatics tools.</p>
<b>SECOND SEMESTER</b>	
<b>BS010201</b> <b>Plant Cell Tissue and Organ Culture</b>	<p>The course is designed to give the student an overview of plant tissue culture which will make her/him appreciate the different techniques involved in the process and finally the applications of plant tissue culture for the greater goal of crop improvement.</p>
<b>BS010202</b> <b>Genetic Engineering</b>	<p>The course is designed to give the student a basic understanding of genetic engineering, various tools and approaches employed and their applications.</p>
<b>BS010203</b> <b>Metabolism and Metabolic Engineering</b>	<p>The course is envisaged to impart in students an understanding of the basic metabolic processes involving major biomolecules in a cell with emphasis on plant cell and how these processes can be manipulated in a suitable living system for meeting the demands of various related industries.</p>
<b>BS010204</b> <b>Biomass and Bioenergy</b>	<p>The course is designed to make the student appreciate biomass as an energy source and the different energy products obtained from various sources of biomass and their utility.</p>



<b>BS010205</b> <b>Laboratory course II</b>	The course is designed to provide the students practical knowledge regarding methods in plant tissue culture and biomass conversion
<b>THIRD SEMESTER</b>	
<b>BS010301</b> <b>Plant Stress Biology</b>	The course is designed to introduce the student to the field of stress biology in plants. The course aims to cover the basics of pathogenesis from the view point of both the host and invading organisms and then the biotic and abiotic stress physiology including the effect of environment on disease development.
<b>BS010302</b> <b>IPR and Translational Research</b>	Research and need for improvisations necessitates the need for development of new technologies, products and processes. The course is designed to make the student aware of legal and other issues involved in their pursuit of academic goals in terms of intellectual property rights, patents and related acts, laws and bioethics. Also the course has a unit on translational research which aims to impart in the student the idea that the research ultimately has to reach the masses through innovations in fields of medicine and agriculture.
<b>BS010303</b> <b>Genomics and Proteomics</b>	Deciphering the genetic makeup and protein population in an organism are among the elementary approaches in biological sciences. The course is envisaged to provide the student an understanding in genomics and proteomics and, the different approaches and techniques employed in these fundamental fields of study.
<b>BS010304</b> <b>Bioprocess Technology and Engineering</b>	Fermentation process is being widely tailor made and used in industries for production of an array of economically important compounds. An understanding of the process as performed in laboratories and industries, techniques, design and instrumentation involved, is required for the student and the course aims to cater to this requirement.
<b>BS010305</b> <b>Laboratory course III</b>	The laboratory course aims to provide the student practical experience in the basic techniques in genetic engineering experiments, plant transformation and formulation and practices in countering pathogen/ pest attack

<b>FOURTH SEMESTER</b>	
<b>Electives Group A</b>	
<b>BS800401</b> <b>Research Methodology and Science communication</b>	The course aims to introduce the student to the philosophy in research and accepted methodologies followed in due course and importance and methods of communicating science effectively. Also a basic understanding regarding biostatistics is also included.
<b>BS800402</b> <b>Molecular Techniques for Crop Improvement</b>	The course aims to impart in the students an understanding of various molecular approaches followed in crop improvement programmes. The students will be introduced largely to the various marker technologies and their applications like in mapping and selection apart from genetic engineering involving nuclear and other organellar genomes, and different traits that are being introduced in the process which helps in crop improvement
<b>BS800403</b> <b>Introduction to Nanotechnology</b>	The course aims to introduce the field of nanotechnology
<b>Electives Group B</b>	
<b>BS810401</b> <b>Plant Developmental Biology</b>	The course is designed as to provide an elementary understanding of various stages of plant development including embryogenesis, shoot, root and floral development
<b>BS810402</b> <b>Systematic Botany, Biodiversity and Economic Botany</b>	The course is designed to provide the student an understanding of three related fields, viz., plant taxonomy, biodiversity and economic botany.
<b>BS810403</b> <b>Ecology and Ecoinformatics</b>	The course aims to impart the fundamental concepts of ecology, important laws and conservation as well as restoration measures and finally introduces the student to ecoinformatics as it is relevant in the current big data era.

<b>Electives Group C</b>	
<b>BS820401 Green House Management and Plant Protection</b>	The course is designed to make the student familiar with methods in green house management and related techniques followed for plant protection from weeds and pathogen/ pest attack.
<b>BS820402 Business Management and Entrepreneurship</b>	The course aims to introduce to the student to general management principles and to the nuances in starting an enterprise
<b>BS820403 Marine Biotechnology</b>	The course incorporates topics which will make the students understand how interventions based on Biotechnology is augmenting solutions in Marine related issues as well as in tapping marine resources more efficiently.
<b>BS010401 Laboratory course IV</b>	To impart practical knowledge in plant tissue culture with emphasis on organ culture and protoplast fusion and in the area of molecular markers.
<b>BS010402 Research Project &amp; dissertation</b>	Students will get an opportunity to show the necessary skills and knowledge in order to organise and conduct a research project.
<b>BS010403 Comprehensive Viva-Voce</b>	A comprehensive viva-voce will be held at the end of the fourth semester covering all the courses of the Programme taught in the entire four semesters. Students will be evaluated through all core subjects and grade will be awarded on the basis of oral answers given by the students
<b>MSc PHYTOMEDICAL SCIENCE AND TECHNOLOGY</b>	
<b>Course</b>	<b>Outcome</b>
<b>FIRST SEMESTER</b>	
<b>BS020101 Microbiology and Plant Molecular Biology</b>	The course is designed to introduce the students to different groups of microorganisms, their structure, important chemical constituents, life cycle and significance of their interaction with environment, and various microbial culture methods. Finally the course aims to provide understanding in the basics of immunology, molecules involved, mechanisms and methods.

<b>BS020102</b> <b>Plant Physiology, Biochemistry and Ecology</b>	The course is designed to give a basic understanding of the chemical makeup of the cell and the different mechanisms in a cell which makes life possible.
<b>BS020103</b> <b>Introduction to Traditional and Modern Systems of Medicine</b>	The course aims to introduce the science of Ayurveda, naturopathy & Unani system of medicine to the students. It is also designed to familiarize the students with modern system of medicine
<b>BS020104</b> <b>Laboratory course I</b>	The objective of the course is to make the students able to do microbiological procedure, plant physiology and biochemistry related experiments.
<b>SECOND SEMESTER</b>	
<b>BS020201</b> <b>Principles of Management</b>	To understand managerial operations of an industry and different types of industries
<b>BS020202</b> <b>Medicinal and Aromatic Plants: Conservation, Cultivation and Management</b>	The main purpose of this course is that students have an approach to economic importance, uses, botany and harvested processes of the most significant medicinal aromatic and seasoning species plants. The course aims to introduce the students to the classification and identification of aromatic plant, seasonings and medicinal plant and to understand cultivation techniques and effective application of current methodology for problem solving
<b>BS020203</b> <b>Systematic Botany, Biodiversity and Economic Botany</b>	The course is designed to develop an understanding among about the morphology, structure & function of various parts of plants. It is designed in a way that the students get acquainted with the basic concepts of ecology & environment. It finally aims at making the students able to appreciate the diversity of ecosystem.
<b>BS020204</b> <b>Laboratory course-II</b>	The objective of the course is to familiarise the students with medicinal plants resources, plant morphology and families of flowering plants. The course also aims at the making the students do soil analysis and Field trial (agrotechnology) for important medicinal plants

<b>THIRD SEMESTER</b>	
<b>BS020301</b> <b>Cell Biology and Biotechnology</b>	The course aims at making the students understand the structures and purpose of basic components of prokaryotic and eukaryotic cells. The course also aims at acquainting the students with various fields of biotechnology & their application
<b>BS020302</b> <b>Phytochemistry</b>	The course aims to provide students with the necessary skills for separation of the active constituents obtained from natural sources (alkaloids – glycosides and anticancer drugs) in addition to the different methods of separation (chromatography).
<b>BS020303</b> <b>Pharmacognosy</b>	This course aims for gaining knowledge about raw drugs and mainly its cultivation , storage and uses
<b>BS020304</b> <b>Laboratory course-III</b>	The course is designed to introduce experiments on estimation of fixed oil and alkaloids, study and physical evaluation of crude drugs and collection and submission of raw drug samples.
<b>FOURTH SEMESTER</b>	
<b>ELECTIVES GROUP A</b>	
<b>BS830401</b> <b>Research Methodology and Science Communication</b>	The course aims to introduce the student to the philosophy of research and accepted methodologies followed in due course and importance and methods of communicating science effectively. Also a basic understanding regarding biostatistics is also included.
<b>BS830402</b> <b>Product Development, Quality Control and IPR</b>	The course is designed to familiarize the students with standard ayurvedic formulations, pharmacopoeia of India and quality control. The course also aims at making the students understand the rights that exist to protect the intellectual holders.
<b>BS830403</b> <b>Basics of Plant Tissue Culture</b>	The course is designed to give the student an overview of plant tissue culture which will make her/him appreciate the different techniques involved in the process and finally the applications of plant tissue culture for the greater goal of crop improvement.

<b>ELECTIVES GROUP B</b>	
<b>BS840401</b> <b>Pharmacology, Clinical Trial and Biostatistics</b>	The course is designed to enable the students to learn the purpose of clinical trials and how Biostatistics is applied to the development, analysis and completion of the clinical trial process
<b>BS840402</b> <b>Business Plan and Entrepreneurship Development</b>	This course aims to promote a culture of entrepreneurship among the students
<b>BS840403</b> <b>Transgenic Techniques for Crop Improvement</b>	The course aims to impart in the students an understanding of various molecular approaches followed in crop improvement programmes. The students will be introduced largely to the various marker technologies and their applications like in mapping and selection apart from genetic engineering involving nuclear and other organellar genomes, and different traits that are being introduced/ augmented in the process which helps in crop improvement
<b>ELECTIVES GROUP C</b>	
<b>BS850401</b> <b>Introduction to Nanotechnology</b>	The course aims to introduce the field of nanotechnology
<b>BS850402</b> <b>Ecology and Ecoinformatics</b>	The course aims to impart the fundamental concepts of ecology, important laws and conservation as well as restoration measures and finally introduces the student to ecoinformatics as it is relevant in the current big data era.
<b>BS850403</b> <b>Green House Management and Plant Protection</b>	The course is designed to make the student familiar with methods in green house management and related techniques followed for plant protection from weeds and pathogen/ pest attack.
<b>BS020401</b> <b>Laboratory course IV</b>	The course is designed to introduce the students to basic techniques in tissue culture and genetic engineering.
<b>BS020402</b> <b>Research Project &amp; dissertation</b>	Students will get an opportunity to show the necessary skills and knowledge in order to organise and conduct a research project.

<b>BS020403</b> <b>Comprehensive Viva-Voce</b>	A comprehensive viva-voce will be held at the end of the fourth semester covering all the courses of the Programme taught in the entire four semesters. Students will be evaluated through all core subjects and grade will be awarded on the basis of oral answers given by the students
<b>MSc FOOD TECHNOLOGY AND QUALITY ASSURANCE</b>	
<b>Course</b>	<b>Outcome</b>
<b>FIRST SEMESTER</b>	
<b>FQ010101</b> <b>Introduction to Food Science &amp; Technology</b>	To provide an introductory foundation in Food Science and Technology upon which more advanced and specialized knowledge can be built and enable students to apply scientific methods independently.
<b>FQ010102</b> <b>Basic Biochemistry</b>	To serve as a torch to trace the intricate complexities and chemical mysteries of food and enable students to understand the biochemical pathways and the relevance to their lives.
<b>FQ010103</b> <b>Food Microbiology</b>	To throw light into the basics of Food Microbiology, acquire an elementary knowledge about physiology of microorganisms, their control and their role in food borne illnesses and food spoilage.
<b>FQ010104</b> <b>Food Chemistry</b>	To acquaint various functional chemical constituents in food and to build a relationship between the dynamic forces of food and the dynamic forces of digestion and growth.
<b>FQ010105</b> <b>Biochemistry and Microbiology- Practical I</b>	To provide a balanced introduction to laboratory techniques and principles those are important in the area of Biochemistry & Microbiology
<b>SECOND SEMESTER</b>	
<b>FQ010201</b> <b>Food Engineering</b>	To scale up laboratory methods to manufacturing process and to understand the operations of food industries as a major functional area.

<b>FQ010202</b> <b>Food Analysis and Instrumentation</b>	To broaden and deepen the coverage and scope of food analysis and to provide an updated knowledge on new developments in food analysis and its emerging applications.
<b>FQ010203</b> <b>Food Preservation Technology</b>	To provide an exhaustible coverage on all major aspects of food preservation and thereby giving a knowledge about various techniques for increasing the shelf life of food and and provide various health benefits by improved food preservation techniques.
<b>FQ010204</b> <b>Food Additives &amp; Packaging Technology</b>	To know the structure and chemical characteristics of chemicals added to food and to provide insight into the scope of packaging technology in food industries.
<b>FQ010205</b> <b>Food Quality Assurance and Management</b>	To contribute a deep insight to the principles and management of food safety and quality assurance and to render a basic knowledge in assessment of food quality, hazards impending the food safety and regulation implemented to assure food quality.
<b>FQ010206</b> <b>Food Additives &amp; Food Preservation-Practical II</b>	To provide knowledge on various methods used for analysis of additives in food and also to gain practical skill in packaging and to determine the efficiency of packaging
<b>SEMESTER III</b>	
<b>FQ010301</b> <b>Technology of Cereals, Pulses and Oil Seeds</b>	To provide a deep coverage in the processing and manufacturing of food products from cereals, pulses and oil seeds and give a general outline about the principles, structure and composition, economic importance and storage of different cereals and their products.
<b>FQ010302</b> <b>Technology of Milk, Meat, Poultry and Fish</b>	To provide knowledge on the composition, nutritive value and uses of dairy and flesh foods and to broaden and deepen the coverage of production, processing and utilization of each food related to Indian and Continental cuisine.
<b>FQ010303</b> <b>Technology of Fruits and Vegetables</b>	To provide knowledge on the pre- and post-harvest technology of fresh fruits and vegetables and to introduce the emerging trends in minimal processing of fruits and vegetables.
<b>FQ010304</b> <b>Food Analysis-Practical III</b>	To provide a knowledge and training on principles and techniques for analysis of food composition



<b>ELECTIVE PAPERS</b>	
<b>ELECTIVE A</b>	
<b>FQ800301</b> <b>Food Biotechnology</b>	To acquire an elementary knowledge about the aspects of applications of biotechnology to food products
<b>FQ800302</b> <b>Technology of Beverages</b>	To introduce the technology behind the processing of beverages and knowledge on various types of beverages.  To emphasize the importance of carbonated alcoholic and non-alcoholic beverages
<b>ELECTIVE B</b>	
<b>FQ810301</b> <b>Proteomics and Genomics</b>	To provide an introductory foundation in proteomics and genomics upon which more advanced and specialized knowledge can be built.  To enable students to apply scientific methods independently
<b>FQ810302</b> <b>Spices and Flavor Technology</b>	To give a broad introduction to the formulation, origins, analysis and performance of flavors  To provide an understanding of all aspects of flavour, in the food, the production chain, the perception by consumers and their contentment during and after eating
<b>ELECTIVE C</b>	
<b>FQ820301</b> <b>Sensory Evaluation and Product Development</b>	
<b>FQ820302</b> <b>Food Sanitation and Hygiene</b>	
<b>FOURTH SEMESTER</b>	
<b>ELECTIVE A</b>	
<b>FQ800403</b> <b>Bakery and Confectionery</b>	To highlight the processing methods used in baking & confectionery industries.  To know about the various types of food products made using baking technology & able to start small scale bakery & confectionery Unit

<b>ELECTIVE B</b>	
<b>FQ810403</b> <b>Research Methodology and Statistics</b>	<p>To understand the significance of research methods and statistics in research.</p> <p>To understand the types, tools and methods of research and develop the ability to construct data gathering instruments appropriate to the research design</p> <p>To understand and apply the appropriate statistical techniques to analyze numerical data and draw inferences.</p>
<b>ELECTIVE C</b>	
<b>FQ820403</b> <b>Byproduct utilization and Waste Management</b>	<p>To enlighten the students on the fundamental aspects of sensory science</p> <p>To provide an updated knowledge on sensory measurements and various sensory factors affecting subjective evaluation</p>
<b>FQ010404</b> <b>Food Processing &amp; Sensory Evaluation-Practical IV</b>	<p>To know the principles and applications of sanitation in food industry.</p> <p>To know about the various types of Sanitation techniques applicable in the food industry</p> <p>To gain an understanding of food hygiene, sanitation and safety during food processing Unit operations.</p>
<b>FQ010405</b> <b>Project Evaluation</b>	Students will get an opportunity to show the necessary skills and knowledge in order to organise and conduct a research project
<b>FQ010406</b> <b>Course Viva-Voce</b>	A comprehensive viva-voce will be held at the end of the fourth semester covering all the courses of the Programme taught in the entire four semesters. Students will be evaluated through all core subjects and grade will be awarded on the basis of oral answers given by the students
<b>MSc BIOINFORMATICS</b>	
Course	Outcome
<b>SEMESTER 1</b>	
<b>BT010101</b> <b>Fundamentals Of Cell Biology And Biochemistry</b>	To integrate fundamental concepts of cell biology and biochemistry and relate the molecular mechanism with Bioinformatics.

<b>BT010102</b> <b>Introduction To Genetics And Molecular Biology</b>	To relate the basic knowledge in Genetics & Molecular Biology and see how it can be applied through Bioinformatics perspective.
<b>BT010103</b> <b>Fundamentals Of Applied Mathematics And Biostatistics</b>	To apply the mathematical and statistical concepts in developing bioinformatics tools applied in life science research.
<b>BT010104</b> <b>Introduction to Computing and Bioinformatics</b>	To introduce basics of working of a Computer in the modern era, teach basic programming languages and develop logic and introduce Bioinformatics, its scope, importance and outreach.
<b>BT010105</b> <b>Laboratory course I</b>	The students are able to understand quantitative & qualitative analysis, Basic programming languages, web page creation.
<b>SEMESTER II</b>	
<b>BT010201</b> <b>Metabolism &amp; Enzymology</b>	To enable to utilize understanding concepts in Metabolism & Enzymology in Bioinformatics. To introduce thrust areas of research in Metabolism & Enzymology.
<b>BT010202</b> <b>General Microbiology</b>	To introduce the research areas in Microbiology and see how they can be manipulated using Bioinformatics, introduces pathogenic microorganisms, their modes of infection, diagnosis and care and introduce basic concepts of gene cloning.
<b>BT010203</b> <b>Genomics</b>	To introduce the concept of genome and its classification, effectively understand the nature and sequences of genome and to devise and extrapolate understanding of genomic data into analytical knowledge.
<b>BT010204</b> <b>Bioinformatics &amp; PERL</b>	To make the students understand the basic methodology in Bioinformatics, programming languages PERL & BIOPERL for beginners in Bioinformatics and the utilization of bioinformatics tools and databases for retrieving, analyzing, understanding and managing biological data.
<b>BT010205</b> <b>Laboratory course II</b>	The student can learn the cultivation, observation and identification of microorganisms.

<b>SEMESTER III</b>	
<b>BT010301</b> <b>Immunology</b>	To introduce the basic concepts of Immunology, acknowledge the scope of immune mechanism in life science research and to integrate the scope of Bioinformatics tools in better understanding of immunological approaches.
<b>BT010302</b> <b>Proteomics and CADD</b>	To introduce basic concepts in Proteomics and their role in Life Science Research, introduce concepts in Computer Aided Drug Design and molecular modeling and signify the role of computational drug discovery methods by providing knowledge on various tools in Bioinformatics.
<b>BT010303</b> <b>Database Concepts &amp; Biological Databases</b>	To teach concepts in developing & creating databases, introduce programming languages and applying them to create databases and comprehensively understand biological databases.
<b>BT010304</b> <b>Advanced Bioinformatics &amp; Linux Operating System</b>	To teach advanced topics in Bioinformatics, introduce Free Software; Linux Operation System and working in a command line environment and introduce the concepts of machine learning and their application in Bioinformatics.
<b>BT010305</b> <b>Laboratory course III</b>	To introduce immunological techniques, Linux programming, SQL commands and php-mysql.
<b>FOURTH SEMESTER</b>	
<b>ELECTIVES GROUP A</b>	
<b>BT800401</b> <b>Genetic engineering &amp; IPR</b>	To teach Genetic Engineering Techniques, concepts in IPR and bioethics.  To effectively signify the relevance of applications in Genetic Engineering in today's industry
<b>BT800402</b> <b>Bioprogramming</b>	To teach R programming language and its application in scientific and commercial domain, learn and to apply languages of Python & Biopython in Bioinformatics and learn and to apply Scilab in Bioinformatics Data Analysis.

<b>BT800403</b> <b>Data mining in Bioinformatics</b>	To utilize data mining techniques and enhance its application in acquiring Biological Data and teach large scale biological data analysis using Bioinformatics Softwares.
<b>BT810401</b> <b>JAVA Programming</b>	To teach programming language JAVA, integrate understanding of JAVA in Bioinformatics and apply in database connectivity.
<b>BT810402</b> <b>Advanced Genomics</b>	To teach advanced concepts for understanding genomes, teach high end sequencing strategies for genomes and learn applications associated with genome analysis.
<b>BT810403</b> <b>Research Methodology &amp; Scientific Writing</b>	To understand the significance of research methods and learn statistical methods involved in Biological research.  To teach the fundamentals of scientific writing
<b>BT820401</b> <b>Basics of Nanotechnology</b>	To introduce the concepts of Nano technology To foresee the scope of nano technology in cancer research  To apply the concepts of nano technology in biological research.
<b>BT820402</b> <b>Pharmaceutical Chemistry &amp; Action of Selected Drugs</b>	To discuss different mode of actions of various drugs in market, understand the chemistry and metabolism of drugs and learn to identify the potency and effectiveness of drugs.
<b>BT820403</b> <b>Bioinformatics Data Analysis</b>	To teach Bioinformatics Data Analysis using Softwares, introduce MATLAB as a programming language and learn avenues in genomic research and their potential.
<b>BT010401</b> <b>Laboratory course IV</b>	Students are able to understand isolation techniques, PCR, Java Programming, Python Programming, Drug Design & Docking.
<b>BT010402</b> <b>Research Project &amp; dissertation</b>	Students will get an opportunity to show the necessary skills and knowledge in order to organise and conduct a research project
<b>BT010403</b> <b>Comprehensive Viva –Voce</b>	A comprehensive viva-voce will be held at the end of the fourth semester covering all the courses of the Programme taught in the entire four semesters. Students will be evaluated through all core subjects and grade will be awarded on the basis of oral answers given by the students