



Shri Vile Parle Kelavani Mandal's MITHIBAI COLLEGE OF ARTS, CHAUHAN INSTITUTE OF SCIENCE
& AMRUTBEN JIVANLAL COLLEGE OF COMMERCE AND ECONOMICS (Autonomous)

NAAC Reaccredited "A" grade, CGPA: 3.57, Granted under FIST-DST & - Star College Scheme of DBT,
Government of India Best College, University of Mumbai 2016-17

FACULTY OF COMMERCE

PROGRAMME: BACHELOR OF COMMERCE (B.COM.)

- *Programme Outcomes*
- *Programme Specific Outcomes*
- *Course Outcomes*

Faculty of Commerce

Programme: Bachelor of Commerce (B.Com.)

Semesters: 6

Credits: 120

Introduction to the Bachelor of Commerce (B.Com.) Programme

The Bachelor of Commerce Programme is a three-year programme under the Choice Based Credit, Grading and Semester system. It is structured and designed to provide graduates with theoretical knowledge and practical skills in all aspects of finance and business. It aims at making the graduates equipped with high level of analytical ability, critical and strategic thinking, good communication and social skills. The programme ensures that learners undergo academic rigour in the various courses incorporated in the programme to strengthen their knowledge base. The programme also incorporates skill based courses that make the learners industry ready.

The B.Com. programme focuses on developing accountancy knowledge and proficiency of learners along with developing knowledge base in critical areas of commerce, management, economics, law and mathematics. All round development of learners is achieved through courses like environmental studies, communication, computer system and application, export marketing, human behaviour at work. Elective courses like entrepreneurship management, Indian financial system, advertising and travel and tourism strengthen the employability of learners as well as encourage entrepreneurship.

The course curriculum of each subject area is developed by the faculty in consultation with academicians of repute and industry experts. The curriculum is reviewed and upgraded to keep up with the changing needs of the stakeholders. The teaching- learning process at the institute is holistic in its approach which incorporates transaction of robust curricula along with several co-curricular activities that develop the overall personality of the learner.

Programme Outcomes

For completion of the B.Com. programme, a learner is required to complete six semesters over three years for the completion of the programme. The broad programme outcomes are:

- *Providing a strong knowledge base*
- *Develop skills to apply the knowledge in functional areas*
- *Enhance employability of the learner by making her/him industry ready*
- *Develop good communication and social skills*
- *To make the learner a responsible citizen*

PO 1: Academic Progression: The learner will be able to make smooth progression to professional courses like Chartered Accountancy, Master of Business Administration, Company Secretary and Law, as well as academic programmes like Masters in Commerce and Economics.

PO 2: Employability: The learner will be ready to enter the corporate sector in the areas of finance, marketing and sales, travel and tourism and other related areas.

PO 3: Effective Communication: The learner will possess good communication skills and will be able to effectively communicate through conventional and electronic media.

PO 4: Entrepreneurial Ability: The learner will have fundamental knowledge and skills in the area of entrepreneurship and will be able to venture into entrepreneurship as a career option if she/he chooses to.

PO 5: Social Skills: The learner will be able to meaningfully engage in inter personal and group social interactions through discussions, opinion formation and negotiations. The learner will be able to manage people and organize events and activities with high degree of proficiency.

PO 6: Environmental Awareness: The learners will be aware of the environmental and ecological challenges faced by society and will have knowledge about environmental management. Learners will be familiar with the significance of environmental ethics in relation to business entities.

PO 7: **Good Citizens:** The learner will have exposure to societal problems and will be empathetic to them. She/he will be informed and aware about the rights and duties of citizens and will be ready to engage in meaningful civic life.

PO 8: **Analytical and Critical Ability:** The learner will be able to critically analyse problems and situations from wide ranging areas like business and corporate sector, economy, society, ecology and environment.

PO 9: **Responsible and Effective Use of ICT:** The learner will be aware of how to use technology for enhancing learning. She/he will be aware of how to make responsible use of technology and social media in communication, discussion forums, forming meaningful communities, participating in social activities and dissemination of knowledge.

Programme Specific Outcomes

PSO1: **Accounting Knowledge:** The learner will be proficient in applying the knowledge acquired to analyse and provide solutions to complex accounting and financial problems in the business world. She/he will be able to understand the application of the concepts in business decision making and will have the required knowledge base for taking advance courses in accountancy.

PSO 2: **Management Skills:** The learner will be able to understand the basic principles of management and relate the principles with the practice of management in real organizations. The Learner will develop skills like goal setting and result based management.

PSO 3: **Understanding the Economic Environment:** The learners will be equipped with the fundamental principles of economics as a decision making science. She/he will have high degree of exposure to economic knowledge enabling her/him to understand and analyse the economic environment and will be adept at understanding impact of economic policies.

PSO 4: Environmental Literary and Awareness: The learner will be exposed to environmental issues at the local, state, national and global levels. She/he will possess understanding of the challenges related to the use of natural resources and the importance the of environmental management systems in all spheres of life.

PSO 5: Legal Knowledge: The learner will have knowledge about the legal aspects of business and corporate sector. She/he will be familiar with the current changes in laws.

PSO 6: Mathematical and Computational Skills: The learner will have skills to use mathematics in business calculation. She/he will have an understanding of investment and resource utilization decisions through mathematical principles. Learners will be able to use basic statistical tools to analyse business data.

PSO 7: Societal Awareness:Thelearner will have a preliminary understanding of significant changes and factors that have influenced the cultural, economic, environmental and political fabric of Indian society. They will beable to develop a well-balanced standpoint for many of the pressing social problems seen in Indian society. They will have basic understanding of human rights issues. They will be able to appreciate the importance of developing a scientific temper towards technology and its use in everyday life.

Course Outcomes

First-Year B.Com. (2019-20)

Accountancy and Financial Management

Semesters I and II

CO 1: To provide a link between accounting concept and real world problems through cases and examples

CO 2: Understanding of the concepts and conventions of accounts

CO 3: Analyze and understand practical aspects of accounts

Commerce

Semester I

Practice of Management

CO 1: Briefly explain Henry Fayol's Principles of Management.

CO 2: Critically evaluate management practices of yesterday, today and tomorrow.

CO 3: Discuss various goal setting techniques.

CO 4: "Whether management is an art or science" Substantiate.

CO 5: Discuss Virtual organisation with examples.

CO 6: Discuss integration of functional department.

CO 7: Explain Result Based Management with example.

CO 8: Discuss applications of CPM and PERT techniques.

Semester II

Services Sector

- CO 1: Explain marketing mix with reference to services sector.
- CO 2: Discuss the importance of services sector for Indian economy.
- CO 3: Distinguish between organized retailing and unorganized retailing.
- CO 4: Briefly explain various store and non-store formats.
- CO 5: “Tourism sector in India has huge potential for growth” Substantiate.
- CO 6: Discuss various trends in the Health Care sector.
- CO 7: Explain advantages and disadvantages of E-Commerce.
- CO 8: Discuss various types of E-Commerce.

Business Economics

Semester I

Microeconomics

- CO1: Discuss the nature of demand curve in perfect competition, monopoly, monopolistic competition and oligopoly.
- CO2: Explain price elasticity and its degrees.
- CO3: Explain the point method, arc method, geometric method and outlay methods of elasticity of demand.
- CO4: Understand the applications of price elasticity of demand in business decision making.
- CO5: Explain the concept, measurement and application of income, cross and promotional elasticity of demand.
- CO6: Why is demand forecasting important for a business entity?
- CO7: Discuss the survey methods of demand forecasting. What are their advantages and drawbacks.
- CO8: What are the statistical methods used to forecast demand?
- CO9: Analyse the Law of Variable Proportions and study its application.
- CO10: Analyse the impact of the Laws of Returns of Returns to Scale on business firms.

CO11: What are economies and diseconomies of scale? Explain the role of technology in this context.

CO12: Explain the concepts of real, opportunity, marginal, incremental, sunk, historical, replacement and production costs.

CO13: What are the short run and long run production cost concepts? Explain their behaviour and impact on business decisions.

CO14: Explain the relationship between total, average and marginal revenue in perfect and imperfect markets.

CO15: Measurement and application of break-even analysis.

CO16: What are the conditions of perfect competition?

CO17: Explain short run and long run equilibrium of the firm in perfect competition.

CO18: Case study of online platforms- use of technology to expand market size, spread of market information – impact on prices and profit.

CO19: What are sources of monopoly power?

CO 20: Explain short and long run equilibrium of a monopolist.

CO 21: What are the features of monopolistic competition?

CO 22: Discuss economic wastage under monopolistic competition.

CO 23: Discuss the role of advertising in monopolistic competition. How has social media affected product promotion?

CO 24: What are the features of an oligopoly market?

CO 25: Discuss the relevance of collusive and non-collusive oligopoly. Explain cartel formation and price leadership.

CO 26: Use of game theory in understanding firm strategy in oligopoly.

Semester II

Principles of Macroeconomics

CO1: Discuss the nature, scope and significance of macroeconomics.

CO2: Explain the functioning of an economy with the help of circular flows of income. What are leakages and injections that affect the flow of income?

CO3: Detailed study of the measurement of national income.

- CO4: Explain the features, phases and management of business cycles.
- CO5: Understanding the Financial Crisis of 2007-08.
- CO6: Explain the determination of effective demand.
- CO7: Discuss consumption function- average and marginal propensities to consume and save.
- CO8: Explain the subjective and objective factors determining consumption function.
- CO9: Explain investment function- marginal efficiency of capital and rate of interest.
- CO10: Explain the workings and importance of investment multiplier and accelerator.
- CO11: What are the constituents and determinants of money supply?
- CO12: Explain transaction and income velocity of money.
- CO13: Discuss the Quantity Theory of money.
- CO14: Discuss the Liquidity Preference Theory of money. How does it differ from the Quantity Theory?
- CO15: Explain the IS-LM Model.
- CO16: Explain core, retail and food inflation.
- CO17: Measurement of inflation- CPI, WPI and GDP deflator.
- CO18: What are the causes and effects of demand pull and cost push inflation.
- CO19: Explain Phillip's Curve and its relevance.
- CO20: Discuss the monetary, fiscal and direct measures to manage price level.

Environmental Studies

Semester I

- CO1: Discuss the changing nature of man-environment relationship.
- CO2: What is the importance of EVS, environmental literacy and awareness?
- CO3: Explain the interdisciplinary nature of EVS.
- CO4: What are the types of ecosystem? Explain functioning of an ecosystem with the help of food chain and food web.
- CO5: Explain functioning of major ecosystems of the world. (Wetlands, mangroves, rivers and lakes)
- CO6: What are the problems associated with managed ecosystems? (Aquaculture, urban ecosystems)

CO7: State the importance of natural resources. What are the factors responsible for over-exploitation of natural resources?

CO8: Explain the resources exploitation and consumption patterns in the world. Bring out the inequalities in resources consumption.

CO9: Discuss 'there is a need for equity in access to and use of natural resources'.

CO10: Discuss with examples the natural resources conflicts. What are the causes and consequences of the conflicts? Discuss how they are addressed in different parts of the world?

CO11: Discuss how over-exploitation of water and energy resources, degradation of soil and forests is happening presently. What are the effects of the same?

CO12: Explain the methods of conservation of soil, forest and energy resources. Explain how efficient water management can be achieved?

CO13: What are the non-conventional sources of energy? Discuss the advantages of non-conventional sources of energy.

CO14: Discuss the role of conservation ethics and traditional value system of India in conservation of natural resources.

CO15: Discuss the pattern of population distribution and growth in the world and India. What are the associated problems?

CO16: Compare the structure and composition of population of developed and developing countries with the help of population pyramid.

CO17: Explain the concept of carrying capacity of the environment and arising concerns.

CO18: What are the challenges posed by growing and declining population? State the measures to control population growth in less developed countries.

CO19: What is Human Development Index? What changes have been introduced in HDI post 2010?

CO 20: With the help of HDI, discuss the pattern of human development in the world and India.

CO 21: What is an environmental hazard? What are the types and sources of environmental health hazards? How to monitor and control environmental health hazards?

CO 22: What are the types of occupational hazards? How to prevent and control occupational hazards?

CO 23: What are the infectious and lifestyle diseases in the contemporary world? Discuss the causes and ways to control them.

- CO 24: Explain what World Happiness Index is.
- CO 25: Explain the process of urbanization. What are the problems associated with urbanization?
- CO 26: Discuss the environmental problems caused by agriculture sector.
- CO 27: Discuss the environmental problems caused by industries.
- CO 28: Explain the causes and effects of global environmental issues viz. excess emission of GHGs, ozone layer depletion, acid rain and biodiversity loss
- CO 29: Discuss the problems of garbage disposal in urban areas and the problems of informal housing.
- CO 30: Discuss the issues of displacement and rehabilitation due to development projects
- CO 31: What is the Ecologically Sensitive Area (ESA), explain with the help of a case study.
- CO 32: What is sustainable development? Why is there a need for sustainable development? How can the goal of sustainable development be achieved?
- CO 33: Name and mark environmentally significant features in the outline map of the world (Deserts, Mountains, Forests, major ports, and major shopping paradise)
- CO 34: With the help of prime meridian calculate the standard time at a place.

Semester II

- CO1: Discuss the changing nature of environmental ethics.
- CO2: What is environmental ethics for businesses and corporations?
- CO3: What is CSR? What is the nature of CSR in India?
- CO4: Explain the Wild Life (Protection) Act, Water (Prevention & Control of Pollution) Act, Air (Prevention & Control of Pollution) Act, The Forest (Conservation) Act, and Environment (Protection) Act in detail.
- CO5: Discuss the Coastal Regulation Zone notification in India and amendments made to it.
- CO6: Explain the concepts of ecological and carbon footprints.
- CO7: What is green consumption?
- CO8: What is green business? Why do businesses go green?
- CO9: What is the role of green technology and eco-labelling in green production and green consumption?
- CO10: Discuss with the help of a case study, green practices adopted by an ecotel.
- CO11: Explain the Polluter Pays Principle (PPP)?

- CO12: Explain the sources and ways to manage solid waste?
- CO13: Explain the concept of smart, safe and sustainable cities.
- CO14: Discuss the major environmental movements in India. (Chipko and Appiko movement, Save Narmada movement, Save Western Ghats movement, save Jaitapur movement)
- CO15: Explain the concept of environmental management and various approaches to environmental management.
- CO16: What is environmental governance? Explain the roles of Ministry of Environment and Forest, Green Tribunals, Pollution Control Boards, and NGO's in Environment Management (Case Studies)
- CO17: What is the role of ISO 14000 in environmental management?
- CO18: What is Environment Impact Assessment (EIA)? Explain the EIA practices in India.
- CO19: Explain the role of geospatial technology in environmental management.
- CO20: Discuss the case study of - Global Climate Change and its impact on Himalayan glaciers, Trans-boundary Movement of Hazardous waste in Nigeria, Threats to Biodiversity in Western Ghats
- CO21: Discuss the case study of - Acid Rain in Siberia, Desertification in Sub-Saharan Africa, Oil Spills off Mumbai coast, Solid Waste Disposal in Mumbai
- CO22: Discuss the case study of - Violation of CRZ in Navi Mumbai, Flooding of low-lying Areas Mithi river basin, Human wild life conflict –Sanjay Gandhi National park
- CO23: Name and mark the environmentally significant features in the outline map of Mumbai.
- CO24: Calculate the ratio scale, representative factor for the map scale given.

Mathematical and Statistical Techniques

Semesters I & II

CO1: Understand basic concepts of mutual funds and shares and make wise investments by calculating rate of return on investments.

CO2: Use counting techniques like permutations and combinations to efficiently solve problems

CO3: Make decisions in industry, investment and business using the techniques of Linear Programming and Decision Making

CO4: Describe statistical data using central measurements, frequency distributions, graphs and measures of dispersion and be able to select which method should be used for different problems.

CO5: Understand and solve problems involving simple probability and discrete probability distributions.

CO6: Solve simple problems involving economic functions. Find break-even point and equilibrium point. Apply derivatives to solve economic problems. Find values for which a function is increasing/decreasing and extreme values.

CO7: Understand concepts of simple interest, compound interest and annuity and make wise investments.

CO8: Use correlation and regression analysis to describe data and solve problems involving bivariate distributions. To predict future values using linear regression.

CO9: Calculate trend values for a time series using Moving Averages and trend line using Least Squares methods. Estimate Seasonal Components for a time series.

CO10: Calculate various types of Index Numbers and solve related problems. Find cost of living index and deflated income using Index Numbers.

CO11: Solve problems involving Binomial, Poisson and Normal probability distributions.

Business Communication

Semester I and II

CO1. To use effective business communication skills to meet the challenges of the professional world and achieve success in his/her professional goals and contribute to the growth of the organization he/she is employed with.

CO 2: **Familiarisation** with the processes and channels of communication which links an organization with its internal and external world.

CO 3: Understand the potency of effective communication in the professional world.

CO 4: Expose learners to communication through technology driven media and acquaint them with the rapidly changing communication technology.

CO 5: Develop writing skills in business correspondences and speaking in interpersonal or group communication situations.

Foundation Course

Semester I

CO1. To understand the pluralistic nature of Indian society

CO2. To sensitize about the gender disparity in society.

CO3. To understand diversity as difference and disparity as inequality.

CO4. To understand the philosophy and structure of the Constitution of India and government bodies working at different levels of government administration

CO5. To create awareness about growing social problems in India

Semester II

- CO1. To understand the impact of globalisation on Indian society
- CO2. To introduce the concept of Human Rights and fundamental rights
- CO3. To understand the importance of environment and sustainable development
- CO4. To recognize factors that cause stress and conflict in present times
- CO5. Awareness of social problems of Indian society: its challenges and remedies

Second-Year B.Com. (2019-20)

Accountancy and Financial Management

Semesters III and IV

- CO 1: Demonstration of the effect on final accounts when a partner is admitted during the year or when partner Retires / dies during the year
- CO 2: Understand piecemeal distribution of cash
- CO 3: Understanding excess capital method, assets taken over by partner, treatment of past profits or losses in the balance sheet
- CO4: Understanding amalgamation of firms
- CO 5: Understanding and computation of profit prior to incorporation
- CO 6: Understanding the process of issue of shares and debentures
- CO 7: Understanding the redemption of preference shares and debentures
- CO 8: Introduction to company final account

Financial Accounting and Auditing- Management Accounting

Semester III

- CO 1: Introduction to the meaning, nature, scope and functions of management accounting
- CO 2: Understanding the significance of management accounting in decision making
- CO 3: Introduction to the basics of raising long term finance

CO 4: Analysis and interpretation of accounts

CO 5: Ratio analysis and integration based on vertical financial statements

CO 6: Providing learners with skills of preparation of cash flow statement with reference to accounting standards

Financial Accounting and Auditing- Auditing

Semester IV

CO 1: Introducing learners to auditing concepts

CO 2: Understanding of audit planning, procedures and documentation

CO 3: Introduction to auditing techniques

CO 4: Understanding vouching and verification

CO 5: Introduction to company audit

Commerce

Semester III Strategic Management

CO 1: Briefly explain fundamental of strategy.

CO 2: Critically evaluate types of strategies.

CO 3: Discuss Mc Kinsey's 7s framework.

CO 4: Explain the role of policies in strategic management.

CO 5: Discuss Strategic Alliance.

CO 6: Discuss business investment strategies.

CO 7: Difference between Blue and Red Ocean Strategy.

CO 8: Discuss new business model for Internet Economy.

Semester IV
Finance Services and Production Management

- CO 1: Briefly explain classification of financial markets with suitable examples.
- CO 2: Discuss the various types of derivative instruments.
- CO 3: Distinguish between fundamental analysis and technical analysis.
- CO 4: Briefly explain the role of venture capitalist in the formation business.
- CO 5: Explain steps in production planning and control.
- CO 6: Discuss factors influencing productivity.
- CO 7: Explain the concepts of product and services quality.
- CO 8: Explain SERVEQUAL Model.

Business Economics

Semester III
Key Macroeconomic Concepts

- CO1: Discuss the nature, scope and significance of macroeconomics.
- CO2: Explain the functioning of an economy with the help of circular flows of income. What are leakages and injections that affect the flow of income?
- CO3: Detailed study of the measurement of national income.
- CO4: Explain the features, phases and management of business cycles.
- CO5: Understanding the Financial Crisis of 2007-08.
- CO6: Explain the determination of effective demand.
- CO7: Discuss consumption function- average and marginal propensities to consume and save.
- CO8: Explain the subjective and objective factors determining consumption function.
- CO9: Explain investment function- marginal efficiency of capital and rate of interest.
- CO10: Explain the working and importance of investment multiplier and accelerator.
- CO11: What are the constituents and determinants of money supply?
- CO12: Explain transaction and income velocity of money.

CO13: Discuss the Quantity Theory of money.

CO14: Discuss the Liquidity Preference Theory of money. How does it differ from the Quantity Theory.

CO15: Explain the IS-LM Model.

CO16: Explain core, retail and food inflation.

CO17: Measurement of inflation- CPI, WPI and GDP deflator.

CO18: What are the causes and effects of demand pull and cost push inflation.

CO19: Explain Phillip's Curve and its relevance.

CO 20: Discuss the monetary, fiscal and direct measures to manage price level.

Semester IV

Foundation of Public Finance

CO1: Discuss the meaning, scope and significance of public finance as a branch of economics

CO2: Explain the Principle of Maximum Social Advantage

CO3: Analyse the causes of market failure

CO4: Discuss the role of the government in correcting market failure.

CO5: Discuss the tax and non-tax sources of public revenue. What is their relative significance?

CO6: Explain the factors determining incidence of indirect taxation.

CO7: Discuss the various economic effects of taxation.

CO8: How is public expenditure classified?

CO9: Wagner's Law and Wiseman-Peacock Hypothesis to explain the growth of public expenditure.

CO10: Discuss the classification and burden of public debt.

CO11: What are the types of fiscal policy?

CO12: What are the constituents and limitations of fiscal policy?

CO13: What the types of deficit?

CO14: Understanding the trends in fiscal deficit in India.

Business Law

Semester I and II

CO1: The student would know and understand the existing commercial laws and its applications.

CO 2: The learner would learn the court proceedings.

CO 3: The student would understand the different aspects of Corporate and other laws.

CO 4: The learner would develop the interest in legal studies.

CO 5: The student would understand the different aspects of Companies and entrepreneurship.

CO 6: The learner will understand the necessity of legal education in detail.

CO 7: The learner will understand the proceedings and the solutions for handling the legal disputes.

Foundation Course

Semester III and IV

CO1: To acquaint a student with Human Right Provisions, Violations and Redressal Mechanisms.

CO2: To sensitise students to environmental concerns.

CO3: To develop Scientific Thinking and Temper.

CO4: To develop soft skills for Effective Interpersonal Communication.

CO5: To provide a brief overview of different Competitive Examinations.

Applied Components

Semester III

Advertising

- CO 1: Define the term advertising and explain its objectives.
- CO 2: Explain the process of creative pitch with example.
- CO 3: Write a note on ASCI and Doordarshan Code.
- CO 4: What are the different methods for calculating advertising budget?
- CO 5: Explain the need and importance of creativity in advertising.
- CO 6: Briefly explain process of developing USP.
- CO 7: Discuss principles of Layout.
- CO 8: Explain the bases for writing slogans and taglines.

Semester III

Sales Management

- CO 1: Explain various functions of sales management.
- CO 2: Discuss various qualities required to become effective sales personnel.
- CO 3: Explain different methods of sales forecasting.
- CO 4: Briefly explain personal selling process.
- CO 5: Write a note on After Sale Services.
- CO 6: Discuss the importance of discounts.
- CO 7: Explain various techniques of training.
- CO 8: Discuss Succession Planning.

Semester III

Travel and Tourism Management

- CO1: What are the motives of tourism?
- CO2: Examine the development of tourism in India.
- CO3: Describe the major travel circuits in the world, India and Maharashtra.
- CO4: What are the environmental, socio-economic, historical, cultural, and political factors that influence tourism?
- CO5: Discuss the impact of social and electronic media on tourism.
- CO6: Explain the importance and role of infrastructure in tourism development?
- CO7: Give an overview of tourism infrastructure in India
- CO8: Write a note on hotel chains in India. Write a note on the ITDC and its hotels.
- CO9: Write a brief note on organizations in hotel industry.
- CO10: What are the new concepts in hotel industry?
- CO11: Write a note on ancillary services in tourism.
- CO12: What are the potential risks involved in tourism sector?
- CO13: Why is there an increased need for safety and security in tourism sector?
- CO14: Write a brief note on UNWTO measures on safety and security at destinations.
- CO15: What are the economic, environmental and socio-cultural impacts of tourism?
- CO 16: What is social responsibility and ethical concerns in tourism?
- CO17: Explain the concept, need for & importance of Sustainable Tourism.

Semester IV

- CO1: Explain the importance of planning in tourism. What are the various approaches to tourism planning? What are the phases involved in the process of tourism planning?
- CO2: What are the types of destinations? What are the steps and problems in destination planning?
- CO3: What is marketing mix in tourism industry? What is market segmentation in tourism?
- CO4: What is Integrated Marketing Communication (IMC) in tourism?
- CO5: What are the steps in Itinerary planning?
- CO6: What are the different types of tour operators? What are the functions of a tour operator?
- CO7: Discuss the organisation and role of travel agencies.

- CO8: What are the documents required for international travel. Explain the procedures and documentation required for a fresh passport?
- CO9: What are the regulations related to foreign travel?
- CO10: Explain the concept of organisation of tourism. Classify tourism organisations.
- CO11: What is the role of tourism organisations? Discuss the role of State Tourism Development Corporation with special reference to MTDC.
- CO12: Explain the role of Indian Institute of Tourism and Travel Management in hospitality.
- CO13: Explain the National Tourism Policy, 2015. Discuss various schemes/ programs of Government of India related to tourism in India.
- CO14: What are the highlights of Maharashtra Tourism Policy 2016.
- CO15: What are the objectives and action plan specified by Department of Tourism for development of adventure tourism, film tourism, and rural tourism in the state of Maharashtra?
- CO16: What are functions of Public Private Partnership Transaction Advisory Cell launched by Department of Tourism, Government of Maharashtra?

Semester III and IV

Indian Financial System

- CO1: Definition and meaning of financial system.
- CO 2: What are the components of the financial system?
- CO 3: Comparison between rudimentary and direct finance.
- CO 4: What is the role of commercial banks in India in project finance and working capital finance?
- CO 5: Explain the credit creation process of commercial banks.
- CO 6: Analysis of the developmental role of the RBI.
- CO 7: What are the instruments and channels of monetary and credit control?

CO 8: What is the significance of NBFCs?

CO 9: Discuss the types of NBFCs operating in India.

CO 10: Discuss the critical role played by the financial market regulators.

CO 11: What factors determine interest rate structure?

CO12: Discuss the structure of Indian money market.

CO 13: Introduction to the functions and importance of Acceptance Houses, Discount Houses, Call money market.

CO 14: What are the components of Indian capital market?

CO 15: Explain the securities issued and traded in the capital market.

CO 16: Explain the role of the functionaries of stock exchanges.

CO 17: Understanding the role of investors in the capital market.

CO 18: What are the sources of raising funds from international markets?

CO 19: Understanding the role of technology in the functioning of the capital market

CO 20: Introduction to government debt securities: types of bonds issued by the Indian government.

CO 21: Discuss the importance and limitations of the corporate bond market.

CO 22: Understanding the role of merchant bankers, venture capital funds, leasing companies and micro finance.

Third-Year B.Com. (2019-20)

Accountancy

Financial Accounting and Auditing Paper VII

Semester V

CO 1: Explain the preparation of the financial accounts of companies.

CO 2: Explaining the need for internal reconstructions.

CO 3: Methods of internal reconstruction.

CO 4: Understand buy back of shares.

CO 5: Investment accounting with reference to accounting standards.

CO 6: Understand valuation of goodwill and shares.

Financial Accounting and Auditing –Financial Accounting Paper IX

Semester VI

CO 1: Understanding of amalgamation, absorption and external reconstruction.

CO 2: Accounting of transactions of foreign currency.

CO 3: Accounting for derivatives

CO 4: Accounting for limited liability partnership

Financial Accounting and Auditing – Cost Accounting Paper VIII

Semester V

- CO 1: Introduce learners to cost accounting.
- CO 2: Understanding all aspects of material cost.
- CO 3: Understanding all aspects of labour cost.
- CO 4: Understanding overheads.
- CO 5: Learn reconciliation and financial accounts.

Financial Accounting and Auditing –Cost Accounting Paper X

Semester VI

- CO 1: Understanding cost control accounts.
- CO 2: Understanding contract costing.
- CO 3: Understanding process costing.
- CO 4: Introduction to marginal costing.
- CO 5: Introducing learners to some emerging concepts of cost accounting.

Direct and Indirect Tax

Semester V

- CO 1: Explain the preparation of the financial accounts of companies.
- CO 2: Understanding basic terms like assessee, assessment, assessment year, annual value.
- CO 3: Explaining the scope of total income.

CO 4: Deduction from total income.

CO 5: Computation of total income for individual.

Direct and Indirect Tax- Indirect Tax

Semester VI

CO 1: Introduction to GST.

CO 2: Understanding levy and collection of tax.

CO 3: Understanding time, place and value of supply.

CO 4: Understanding input tax credit and payment of tax.

CO 5: Familiarising learners with registration under GST law.

Business Economics

Semester V

Indian Economy: Issues and Prospects

CO 1: What are the causes of low productivity in Indian agriculture?

CO 2: Discuss the measures to improve agricultural productivity in India.

CO 3: Understanding the dynamics of food prices and food inflation in India.

CO 4: What has been the effect of the New Industrial Policy 1991 on the Indian industrial sector.

CO 5: Explain the role and challenges faced by the MSME sector.

CO 6: Discuss the MSME policy initiatives of the government

CO 7: Explain the significance and growth trends in the services sector.

CO 8: Discuss the Competition Act 2003.

CO 9: Analyse the disinvestment policy and its progress.

CO 10: Explain the structure of commercial banks.

CO 11: Explain the role and structure of capital market and money markets in India.

CO 12: Discuss important financial sector reforms.

CO 13: Understanding and analyzing current policy initiatives of the government – Make in India, Skill India, FDI policy.

Semester VI

International Trade and Foreign Exchange

CO 1: Explain Ricardian Comparative Cost Theory of trade.

CO 2: Critically evaluate the Heckscher-Ohlin theory of trade.

CO 3: What are the different measurements of terms of trade?

CO 4: What are the various gains from trade and what factors affect the gains?

CO 5: Explain the arguments in favour of and against the policies of protectionism and free trade.

CO 6: Understanding the various tariff and non-tariff barriers to trade.

CO 7: Impact of trade wars.

CO 8: Understand international economic integration.

CO 9: Discuss EU, ASEAN and Brexit.

CO 10: Explain the structure of balance of payments.

CO 11: Explain the causes of and measures to correct disequilibrium in balance of payments.

CO 12: Understand the implications of the WTO agreements.

- CO 13: Explain the functions of the foreign exchange market.
- CO 14: Explain the determination of the equilibrium rate of exchange.
- CO 15: Critically evaluate the Purchasing Power Parity Theory.
- CO 16: How do hedgers, speculators and arbitrageurs operate in the foreign exchange market?
- CO 17: What is the role of the central bank in managing exchange rate fluctuations?

Commerce

Semester V

Marketing Management

- CO 1: Discuss the evolution of marketing concepts with suitable examples.
- CO 2: Explain Customer Relationship Management with examples.
- CO 3: Discuss marketing mix during various stages of Product Life Cycle.
- CO 4: What are the different reasons for brand extension?
- CO 5: Explain factors influencing pricing.
- CO 6: Explain process of Integrated Marketing Communication.
- CO 7: Write a note on Supply Chain Management.
- CO 8: Explain prospects and challenges of Rural Marketing.

Semester VI

Human Resource Management

- CO 1: Explain various functions of human resource management.
- CO 2: Distinguish between recruitment and selection.
- CO 3: Explain essential sound training programme.
- CO 4: Briefly explain techniques of performance appraisal.
- CO 5: Write a note on Blake and Mouton Managerial Grid.
- CO 6: Discuss factors influencing emotional quotient and spiritual quotient.

CO 7: Explain William Ouchi's Theory Z.

CO 8: What are the causes of low employee morale and suggest measures to overcome it.

Export Marketing

Semester V

CO 1: Explain the importance of export marketing to business firms and to the nations.

CO 2: Discuss various export pricing quotations.

CO 3: Distinguish between tariff and non-tariff barriers.

CO 4: Explain the major agreements of WTO.

CO 5: Discuss Foreign Trade Policy 2015-20.

CO 6: Discuss special benefits given to Status Holders.

CO 7: Explain Marketing Development Assistance and Market Access Initiative.

CO 8: Write a note on SIDBI.

Entrepreneurship Management

Semester VI

CO 1: Distinguish between entrepreneurs and intrapreneurs.

CO 2: Explain various theories of entrepreneurship.

CO 3: Write a note on Business Life Cycle.

CO 4: What are the different types of feasibility study?

CO 5: Explain factors influencing fixed and working capital requirements of a firm.

CO 6: Briefly explain the process of obtaining bank loans.

CO 7: Discuss various techniques of CRM.

CO 8: Explain recent trends in distribution.

Psychology of Human Behaviour at Work

Semester V and VI

CO1: Help the learner understand organizational behaviour, the disciplines that contribute to the field of organizational behaviour and the challenges and opportunities of this field.

CO2: Make the learner aware of the importance of interpersonal skills.

CO3: Understand the functions, roles and skills of managers.

CO4: Help the learner understand the main components of attitudes and identify the major job attitudes.

CO5: Understand job satisfaction, its measurement, causes and impact at the workplace.

CO6: Make the learner aware of motivation - Early and contemporary theories of motivation.

CO7: Understand leadership - the Trait and Behaviour Theories of Leadership, Contingency Theories of Leadership, Leader-Member Exchange Theory.

CO8: Help the learner understand the key characteristics and dark side of the charismatic leadership and the characteristics of transactional and transformational leaders.

CO9: Help the learner understand the differences between groups and teams, the different types of teams and the procedure to create effective teams

CO10: Define conflicts and discuss the transitions in conflict thoughts. Help the learner understand the conflict process in detail.

CO11: Help the learner understand the meaning and process of negotiation along with bargaining strategies.

CO12: Help the learner understand the functions, process and direction of communication, the barriers to effective communication and the global implications for managers.

CO13: Examine interpersonal and organizational communication.

CO14: Examine the various communication channels and role of persuasive communications.

CO15: Help the learner understand the forces of change in organizations, work stress and it's management.

Computer Systems and Applications

Semester V and VI

CO1: Know basic concepts of Data Communication, Networking and the Internet.

CO2: Understand database concepts and know common syntax for MySQL.

CO3: Use MySQL to create databases, insert, update and delete data.

CO4: Use MySQL to retrieve data using simple queries, using conditions, using logical, arithmetic and relation operators and aggregate functions. Use multi-table and nested queries

CO5: Use MS-Excel to create, navigate and add information to worksheets. Use financial, mathematical and statistical functions

CO6: Use MS-Excel to create, use and link multiple spreadsheets. Use formulas and logical operators in MS-Excel.

CO7: Use MS-Excel for data analysis by means of sorting, filtering, subtotaling and pivot tables.

CO8: Work with MS-Excel using different types of functions – database, conditional/logic, date, string, statistical

BACHELOR OF MANAGEMENT STUDIES

PROGRAMME OUTCOME:

- PO1:** Obtain necessary knowledge and insight about management models and practices, enabling the learners to become effective professionals.
- PO2:** Build a strong foundation so that higher education in various fields of management can be pursued.

PROGRAMME SPECIFIC OUTCOME:

- PSO1:** A well-rounded academic foundation, through a blend of courses in the Management field and focused subject areas, such as administration, communication, team work, leadership, ethics and integrity, decision making and problem-solving abilities.
- PSO2:** The ability to think critically across a variety of subjects, fostering an informed, independent worldview.
- PSO3:** Students will possess knowledge and skills required to join entry and middle level management positions in the corporate world.
- PSO4:** BMS course offers a well-rounded curriculum covering all aspects of business to equip students to start entrepreneurial ventures.
- PSO5:** Through group projects students' exhibit leadership capacity and teamwork skills for business decision making.
- PSO6:** Students will demonstrate - effective communication, understanding of global business and environmental perspectives, creative problem solving.
- PSO7:** Students will develop as effective management professionals and take on more responsibilities in future and to give outstanding results in the area of their interest
- PSO8:** The ability to understand, analyze and apply management concepts in the areas related to marketing, human resources and finance for efficient running of the business organization of varying complexity in competitive era.

SEMESTER I

UCMABMS101

Organisation Behaviour

Learners will be able to

- CO1:** Get an understanding of reasoning behind people's behaviour in organizations and their complex nature.
- CO2:** Be able to identify causes and effects of that behaviour to help in effective utilization of human resources

UCMABMS102

Principles of Management

Learners will be able to

- CO1:** Understand the management theory that builds the base for management education and practise
- CO2:** Understand and appreciate the functions of management and complexities involved in managing a business through contemporary business cases
- CO3:** Be able to work as contributing members of a team utilizing these functions of management.

UCMABMS103

Introduction to Financial Accounts

Learners will be able to

- CO1:** Understand the core accounting principles, difference between capital and revenue receipts and expenditure.
- CO2:** Prepare final accounts of business organisations (sole trader) and will be able to read and interpret financial accounts with an objective to ameliorate profitability and organisational financial performance.

UCMABMS104

Business Law

Learners will be able to

- CO1:** Comprehend the prerequisites of contracts and various kinds of contracts.
- CO2:** Get an understanding of various laws applicable to business (Partnership Act, Sale of Goods Act, LLP Act, IT Act)

UCMABMS105

Business Mathematics

Learners will be able to

- CO1:** Comprehend how mathematics plays a significant role in finance and business decisions.
- CO2:** Learn the technique of forecasting and interpolation.
- CO3:** Gain knowledge of financial mathematics which will equip them to take enhanced investment and financial decisions.

UCMABMS106

Business Communication – I

Learners will be able to

- CO1:** Understand the role of communication in business and appreciate art of communicating in the business world.
- CO2:** Possess in-depth knowledge of various means of written, oral and other forms of professional communication in the business world.
- CO3:** Through practical training the learner will develop communication skills, namely – professional business writing, presentations and attending an interview.

UCMABMS107

Indian Contemporary Issues (Foundation Course)

Learners will be able to

- CO1:** Get an overview of Indian society and its multicultural diversity
- CO2:** Be familiar with the Indian constitution and political system
- CO3:** Understand the causes and effects of economic and societal disparity.

SEMESTER II

UCMABMS201

Business Economics-I

Learners will be able to

- CO1:** Comprehend the core Micro Economic Concepts.
- CO2:** Understand how the forces of demand and supply interact and how equilibrium is established.

CO3: Identify different types of market structures and the equilibrium situations of such market structures.

UCMABMS202

Cost Accounting

Learners will be able to

CO1: Understand the nature of cost accounting and how it is a positive as well as normative science.

CO2: Get an understanding of different methods of labour, material and overhead costing.

CO3: Prepare Cost Sheet and Reconciliation statement.

UCMABMS203

Marketing Management

Learners will be able to

CO1: Comprehend the definitions of Marketing and its role in business and society

CO2: Get thorough knowledge about 4 Ps of marketing, along with insights into related topics of consumer behaviour, branding, and upcoming trends in the field of marketing management.

UCMABMS204

Industrial Law

Learners will be able to

CO1: Become aware of the significant laws applicable to industries.

CO2: Gain knowledge of such acts will help them to relate to real life situations.

UCMABMS205

Business Statistics

Learners will be able to

CO1: Gain insight of various statistical tools which will empower the learners to take an informed and sound decision.

CO2: Understand the significance of statistics and its wide scope.

CO3: Use forecasting techniques which will enable them to take good decision in real life situations.

UCMABMS206

Computer Applications in Business

Learners will be able to

CO1: Become aware of the fundamental concepts of computer.

CO2: Become familiar with the computer applications used in business.

UCMABMS207

Sustainability Management

Learners will be able to

CO1: Comprehend the definitions of sustainability, environment and place of organizations as a part in the larger environment

CO2: Be abreast with global initiatives taken for environment management

CO3: Become aware of the journey of materials economy and its impact on environment

CO4: Appreciate existing sustainable business practices and think of alternatives to environmental damaging systems of business

SEMESTER III

UCMABMS301

MANAGEMENT ACCOUNTING

Learners will be able to

- CO1:** Comprehend the importance of Management Accounting in decision making
- CO2:** Understand the importance of Ratio analysis and interpretation.
- CO3:** Understand the Preparation of cash flow statements with reference to Accounting Standard No 3.
- CO4:** Understand the Estimation of working capital requirements.

UCMABMS302

CONSUMER BEHAVIOUR

Learners will be able to

- CO1:** Develop an understanding of consumer motivations and decision processes.
- CO2:** Know variables that comprise and affect consumer behaviour.

UCMABMS303

STRATEGIC MANAGEMENT

Learners will be able to

- CO1:** The learners will be able to analyse the importance of environment analysis, strategy formulation, types and benefits of strategies and the key challenges faced in formulation and implementation of strategies

UCMABMS304

ENTREPRENEURSHIP MANAGEMENT

Learners will be able to

- CO2:** Have a better understanding of the entrepreneurial culture in the country
- CO3:** Take strategic decisions suitable for the best performance of their entrepreneurship venture
- CO4:** Take greater responsibility and become capable to manage their enterprises.

UCMABMS305

BUSINESS ECONOMICS – II (MACRO)

Learners will be able to

- CO1:** Understand the meaning, nature and subject matter of macro-economics.
- CO2:** Understand the major macro-economic problems like inflation.
- CO3:** Get an insight of various instruments of monetary and fiscal policies and the objectives of such policies.
- CO4:** Develop an understanding of theories of international trade.

UCMABMS306

BUSINESS RESEARCH METHODS

Learners will be able to

- CO1:** Inculcate the analytical abilities and research skills.
Gain hands on experience and learning in Business Research.

SEMESTER IV

UCMABMS401

TAXATION

Learners will be able to understand:

- CO1:** Principles of Direct and Indirect taxes
- CO2:** Calculation of tax
- CO3:** About Tax authorities and their procedures

UCMABMS402

FINANCIAL MANAGEMENT

Learners will be able to:

- CO1:** Understand the concept of finance, cost of capital
- CO2:** Understand the concepts of capital structure, Capital Budgeting, etc.

UCMABMS403

HUMAN RESOURCE MANAGEMENT

Learners will be able to

- CO1:** Comprehend the dynamic nature and process of Human Resource Management.
- CO2:** Identify problems related to human resources and will be able to provide concrete solutions to overcome the same.

UCMABMS404

SALES AND DISTRIBUTION MANAGEMENT

Learner will be able to:

- CO1:** Develop an understanding of the sales & distribution processes in organizations.
- CO2:** Get familiarized with concepts, approaches and the practical aspects of the key decision-making variables in sales management and distribution channel management.

UCMABMS405

PRODUCTION AND TOTAL QUALITY MANAGEMENT

Learners will be able to

- CO1:** Understand the concept of Fundamentals of Research & defining the research problem
- CO2:** Understand the importance and types and Formulation of hypothesis and testing of hypothesis.

UCMABMS406

DATA ANALYTICS

Learners will be able to

- CO1:** Competently use data to perform reporting and do analysis for helping businesses
- CO2:** Get a first-hand understanding to enforce critical thinking into decision making process

SEMESTER V

UCMABMS501

LOGISTICS & SUPPLY CHAIN MANAGEMENT

Learners will be able to

- CO1:** Grasp the difference between Logistics and SCM

CO2: Have a better understanding of the physical distribution system including inventory management and transportation

CO3: Up-to-date with the latest trends in the Logistics and Supply Chain Industry

UCMABMS502

BUSINESS ETHICS AND CORPORATE GOVERNANCE

Learners will be able to

CO1: Differentiate between ethical and unethical practices in business

CO2: Realize the significance of ethical business and will transform into a person of integrity

UCMABMS503

INVESTMENT ANALYSIS & PORTFOLIO MANAGEMENT

Learners will be able to

CO1: Investment process, Portfolio Management Strategies

CO2: Diversification, portfolio risk and return, single index model, the sharpe index model, Portfolio Beta

CO3: Portfolio rebalancing, portfolio upgrading, Formula plans, constant ratio plan, variable ratio plan, selection and revision of equity portfolio Performance measurement

UCMABMS504

COMMODITY & DERIVATIVES MARKETS

Learners will be able to

CO1: Understand the concepts related to Commodities and Derivatives market

CO2: Study the various aspects related to options and futures

CO3: Be acquainted with the trading, clearing and settlement mechanism in derivatives market.

UCMABMS505

WEALTH MANAGEMENT

Learners will be able to

CO1: Get an overview of various aspects related to wealth management

CO2: Study the relevance and importance of Insurance in wealth management

CO3: Get acquainted with issues related to taxation in wealth management

CO4: Understand various components of retirement planning

UCMABMS506

DIRECT TAXES

Learners will be able to

CO1: Learn the rules and procedures under the Income Tax Act applicable to individuals

CO2: Compute the income chargeable to tax under the various heads of income

CO3: Comprehend and apply the provisions governing deduction of tax at source from certain specified income and payments

UCMABMS503

SERVICES MARKETING

Learners will be able to

CO1: Appreciate the difference between marketing physical products and intangible services, including dealing with the extended services marketing mix, and the four unique traits of services marketing

CO2: Know how to use the challenges inherent to services as opportunities to win customers

CO3: Recognize the challenges faced in services delivery as outlined in the services gap model-

UCMABMS504

E-COMMERCE & DIGITAL MARKETING

Learners will be able to

CO1: Understand increasing significance of E-Commerce and its applications in Business and Various Sectors

CO2: Get an insight on Digital Marketing activities on various Social Media platforms and its emerging significance in Business

CO3: Understand Latest Trends and Practices in E-Commerce and Digital Marketing, along with its challenges and opportunities for an organisation

UCMABMS505

SALES & DISTRIBUTION MANAGEMENT

Learners will be able to

CO1: Develop an understanding of the sales & distribution processes in organizations

CO2: Be familiarized with concepts, approaches and the practical aspects of the key decision-making variables in sales management and distribution channel management.

UCMABMS506

CUSTOMER RELATIONSHIP MANAGEMENT

Learners will be able to:

CO1: Understand the concept of Customer Relationship Management (CRM) and implementation of Customer Relationship Management

CO2: Get an insight into CRM marketing initiatives, customer service and designing CRM strategy

CO3: Understand new trends in CRM, challenges and opportunities for organizations

SEMESTER VI

UCMABMS601

OPERATIONS RESEARCH

Learners will be able to:

CO1: Develop a general understanding of the operational research approach to decision making in business

CO2: Take optimistic decision regarding the best plan of action given the set of set of circumstances

UCMABMS602

INDIAN MANAGEMENT THOUGHTS AND PRACTICES

Learners will be able to:

CO1: Have a greater understanding of the Ancient Indian philosophies and their importance in life and management

CO2: Be motivated to follow ethical work culture

CO3: Manage and balance work and life in a better way

UCMABMS603

INTERNATIONAL FINANCE

Learners will be able to:

CO1: Understand the Foreign Exchange Market & Indian Foreign Exchange Market

CO2: Understand the Operational aspects of foreign exchange market and foreign exchange contracts & Foreign Exchange Arithmetic and Risk Management

UCMABMS604

INNOVATIVE FINANCIAL SERVICES

Learners will be able to:

CO1: Get familiar with the fundamental aspects of various issues associated with various financial services

CO2: Get a comprehensive overview of emerging financial services in the light of globalization

UCMABMS605

INDIRECT TAXES

Learners will be able to:

CO1: Understand the basics of GST

CO2: Study the registration and computation of GST

CO3: Get acquainted with filing of returns in GST

UCMABMS606

STRATEGIC FINANCIAL MANAGEMENT

Learners will be able to:

CO1: Match the needs of current market scenario and upgrade their skills and knowledge for long term sustainability

CO2: Understand the changing scenario in Banking Sector and positively affect their inclination towards banking as a career

CO3: To get acquainted with contemporary issues related to financial management

UCMABMS607

BRAND MANAGEMENT

Learners will be able to:

CO1: Understand the meaning and significance of Brand Management

CO2: Know how to build, sustain and grow brands

CO3: Know the various sources of brand equity

UCMABMS608

RETAIL MANAGEMENT

Learners will be able to:

CO1: Comprehend the pivotal role played by a retailer in a society

CO2: Gain an insight pertaining to important aspects, strategies, issues and careers in retailing

UCMABMS609**INTERNATIONAL MARKETING**

Learners will be able to:

CO1: Understand how marketing mix assumes greater importance in an international business

CO2: Understand how environments of different countries affect decision making for an international business

UCMABMS610**CORPORATE COMMUNICATION & PUBLIC RELATIONS**

Learners will be able to:

CO1: Understand how internal and external communication is managed in an organisation

CO2: Understand the concept of different publics and the need to manage them in a specialized way

Bachelor of Commerce (Accounting & Finance)

Programme Outcome

Upon successful completion of a Bachelor of Commerce, learners will be able to:

- PO1:** Understand various accounting tools and system related to business
- PO2:** Understand existing Taxation rules applicable to business.
- PO3:** Apply theoretical and technical business knowledge, skills and research techniques in Practical business
- PO4:** Understand legal aspects of business and corporate sector
- PO5:** Understand and solve complex accountancy and finance problems
- PO6:** Make effective use of IT tools in all aspects of business
- PO7:** Understand required mathematical, analytical and statistical tools for financial and accounting analysis
- PO8:** Develop effective communication skills both oral as well as written and including business communication skills.
- PO9:** Understand various Marketing strategies and Management techniques to be applied in business
- PO10:** Understand Economic and political Environment of business
- PO11:** Exercise critical thinking and reasoning in the analysis of business problems
- PO12:** Develop awareness about social and environmental issues affecting business

Bachelor of Commerce (Accounting & Finance) - BAF

Programme Specific Outcome

Towards the end of this programme, learners will be able to:

- PSO1:** Apply the knowledge of Accounting, Taxation and Finance in Industry.
- PSO2:** Understand the application of IND-AS, IFRS for Companies.
- PSO3:** Know the taxation system of India (Income tax , GST & Customs)
- PSO4:** Accumulate and Apply knowledge of various branches of Accounting.
- PSO5:** Know the structure and importance of Indian Financial System and financial services.
- PSO6:** Understand the working of different financial markets- Equity, Debt, Derivatives, Commodities, Foreign Exchange.
- PSO7:** Identify the relevance of Investing & Financial Planning.
- PSO8:** Acquire knowledge of rules and regulation under various law.

SEMESTER I

UCMABAF101

Elements of Financial Accounting

Learners will be able to

- CO1:** Demonstrate knowledge of preparation of Final Accounts through analysis and synthesis of information as well.
- CO2:** Understand accounting from incomplete records and branch.

UCMABAF102

Quantitative Techniques

Learners will be able to:

- CO1:** Understand the Measures of central tendency, probability and dispersion.

- CO2:** Apply the theory in real business scenarios
- CO3:** Understand various statistical methods
- CO4:** Studying functions of different types and their use in business
- CO5:** Learners will be able to understand functions and their applications in business.

UCMABAF103

Fundamentals of Financial Management

Learners will be able to:

- CO1:** Understand the concept of leverage, to explain various types of leverages, to understand the relationship among various leverages, to identify the reasons for occurrence of financial ,operating and combined leverage, to appreciate the importance of leverage analysis in capital structure decisions, to compute various leverages using simple information.
- CO2:** Understand the raising of finance from various resources which will depend upon decision on type of source, period of financing, cost of financing and the returns thereby.

UCMABAF104

Business Communication

Learners will be able to:

- CO1:** Be introduced with the growing need for communication skills in a rapidly changing world. All changing scenarios and required skills are discussed. This is followed by explaining the Course Syllabus and Assessments. The subject is taught with constant practical applications.

UCMABAF105

Indian Contemporary Issues

Learners will be able to:

- CO1:** Evaluate the impact of prior knowledge or familiarity about society and to analyse the role of colonial rule in shaping Indian consciousness and nationalism.
- CO2:** To understand the causes and impact of environment on human life.
- CO3:** To understand Growth of information technology and communication and its impact manifested in everyday life and Impact of globalization on industry.

UCMABAF106

Introduction to Management

Learners will be able to:

- CO1:** Understand the theory of management
- CO2:** Apply the theory in real business scenarios
- CO3:** Understand the history, school of thoughts and evolution of management
- CO4:** Getting a manager's perspective business
- CO5:** Learn the functions and process of management

UCMABAF107

Business Economics-I

Learners will be able to:

- CO 1:** Understand the different theories in Economics
- CO 2:** Apply the theory in real business scenarios
- CO 3:** Understand the economic issues and problems faced by individuals, organisations and society.

CO 4: Getting a manager's perspective business

SEMESTER II

UCMABAF201

Financial Accounting -Firms

Learners will be able to:

- CO1:** Understand special features and accounting treatment of Partnership business, analyse the difference between partnership firm and LLP
- CO2:** To demonstrate knowledge of preparation of Final Accounts through analysis and synthesis of information as well.

UCMABAF202

Elements of Cost Accounting

Learners will be able to

- CO 1:** Express the place and role of cost accounting in the modern economic environment
- CO 2:** Select the costs according to their impact on business
- CO 3:** Differentiate methods of schedule costs per unit of production
- CO 4:** Differentiate methods of calculating stock consumption
- CO 5:** Interpret the impact of the selected costs method
- CO 6:** Identify the specifics of different costing methods

UCMABAF203

Equity Market

Learners will be able to

- CO1:** Understand the characteristics of different financial assets such as money market instruments, bonds, and stocks, and how to buy and sell these assets in financial markets.
- CO2:** Understand the concept of Equity Market & Valuation of Equities

UCMABAF204

Fundamental of Investment

Learners will be able to

- CO1:** To understand basic and importance of investments
- CO2:** To understand various investment products, asset allocation and review of investments

UCMABAF205

Principles of Banking and Insurance

Learners will be able to:

- CO1:** Understand the development of financial system
- CO2:** Apply the theory in real business scenarios
- CO3:** Understand the history, school of thoughts and evolution of banks and Insurance sector.
- CO4:** Getting a managers perspective business
- CO5:** Learn the functions and process of banking and insurance sector

UCMABAF206

Legal Aspects of Business

Learners will be able to:

- CO1:** Know how to protect the interest and safeguard the rights of the workers

CO2: Have a basic understanding of contracts and I.T.Act,2000

CO3: Know all the provisions governed by Indian Partnership Act and Limited Liability Partnership Act.

UCMABAF207

Business Economics - II

Learners will be able to:

CO1: Understand the meaning of Macro economics with special reference to Circular Flow of Income, National Income Concepts and the numericals on National Income and GDP Deflator, theory of multiplier

CO2: Learn the concept of Public revenue and expenditure, public debt and concept of deficits.

CO3: Understand constituency of Fiscal Policy and concepts of Fiscal Responsibility and Budget Management Act.

SEMESTER III

UCMABAF301

Financial Accounting - Special Accounting Areas

Learners will be able to:

CO1: Account procedure clarity on Fire Insurance Claim

CO2: Analyse the components of Total Hire Purchase Price and the Process of Calculation and Allocation under different situation

CO3: Understanding of Accounting norms for Co-operative Societies.

UCMABAF302

Operations Research

Learners will be able to

CO1: Develop a report that describes the model and the solving technique, analyse the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.

CO2: Understand the mathematical tools that are needed

UCMABAF303

Indirect Taxes – GST

Learner will be able to understand,

CO1: Existing system in relation to GST

CO2: GST Registration procedure and other provisions

CO3: GST payment and return filing procedure along with computation of interest and penalty

CO4: CO 4: Specific provisions of Integrated Goods and Service Tax Act, 2017.

UCMABAF304

Strategic Financial Management

Learner will be able to,

CO1: Understand different types of capital structure theories and application of those theories

CO2: Understand dividend types and issues surrounding dividend policy decisions

CO3: Understand management approach towards working capital management

CO4: Identify and evaluate the necessary tools to use in managing a company's net daily cash position, Inventory and Receivables Management.

UCMABAF305

Organisational Behaviour

Learner will be able to,

CO1: Analyse the behaviour of individuals and groups in organisations in terms of the key factors that influence organisational behaviour.

CO2: Understand the personality theories and the types

CO3: Analyse the type of teams and group decision making

CO4: Determine the source of organisational conflict and how to resolve them.

UCMABAF306

Company Law

Learners will be able to,

CO1: Understand provisions of Company Act

CO2: Learn various types of Prospectus and related norms

CO3: Role of Directors in the Company and their responsibilities

CO4: Learn about the current policy trends and developments in Company Law.

UCMABAF307

Indian Economy

Learners will be able to,

CO1: Understand the various aspects of India's economy

CO2: Understand sectoral trends and issues in Agriculture, Industry and Services, Financial Sector, Foreign Trade and Balance of Payments and Public Finance

CO3: Understand the role of the Indian Economy in the global context, and how different factors have affected this process.

CO4: Understand money market and its features and the role of RBI and SEBI as regulatory bodies.

SEMESTER IV

UCMABAF401

Corporate Financial Accounting

Learner will be able to

CO1: Understand provisions and Write book of account for issue of shares, redemption of preference shares and buy back of equity shares, issue and redemption of Debentures

CO2: Draft Financial statements as per the Companies Act.

UCMABAF402

Methods of Costing

Learner will be able to

CO1: Meaning of Process & Contract Costing and accounting for profit or loss in cost accounting

CO2: Understand conceptual difference between integrated and non-integrated cost accounting system along with entries

CO3: State the meaning of Operating Costing and determine the costing procedure for service industry

UCMABAF403

Management Accounting

Learner will be able to

- CO1:** Describe and explain the nature, source, and major purposes of management accounting and control.
- CO2:** Read and analyse Financial Statements with the help of accounting ratios for decision making
- CO3:** Identify and use information in costing, pricing, budgetary control and Standard Costing concepts to solve a range of business problems and provide management with decision-relevant information.

UCMABAF404

Indirect Taxes - GST and Customs

Learner will be able to,

- CO1:** Apply the rules related to payment and refund of tax under GST provisions
- CO2:** Filing of returns and related provisions
- CO3:** Maintain accounts and understand audit norms
- CO4:** Understand provisions under Customs Act.

UCMABAF405

Research Methodology in Accounting and Finance

Learner should be able to:

- CO1:** Assess critically various methods: literature study, case study, structured surveys, interviews etc.
- CO2:** Apply a range of quantitative and / or qualitative research techniques to business and management problems / issues
- CO3:** Understand and apply research approaches, techniques and strategies in the appropriate manner for managerial decision making
- CO4:** Develop necessary critical thinking skills in order to evaluate different research approaches utilized in the service industries
- CO5:** Write report after research data processing and interpretation

UCMABAF406

SEBI Act and IPR

Learners will be able to:

- CO1:** Understand the nature and purpose of law governing securities
- CO2:** Role of SEBI and its regulations
- CO3:** Law governing the intellectual Property Rights.

UCMABAF407- Debt and Money Market

Learners will be able to:

- CO1:** Understand the working of Debt Market and Bond Market
- CO2:** Understand various instruments of Debt and Bond Market
- CO3:** Describe Money Market and its various instruments

SEMESTER V

UCMABAF501

Cost Accounting – III

Learners should be able to

CO 1: Understand the benefits of Uniform Costing and Inter- firm comparison

CO 2: Understand conceptual difference between integrated and non-integrated cost accounting system along with entries

CO 3: State the meaning of Operating and Process Costing

CO 4: Learn the methods of valuation of work in progress

UCMABAF502

Financial Management -II

Learners should be able to :

CO 1: Estimate Capital Budgeting requirement and risk analysis.

CO 2: Determine capital structure decisions

CO 3: Ascertain the valuation techniques of mutual fund and bond market

CO 4: Understand and evaluate Credit Management techniques

UCMABAF503

Taxation – IV (Indirect Taxes – I I)

Learner will be able to understand,

CO 1: Existing system in relation to GST

CO 2: GST Registration procedure and other provisions

CO 3: GST payment and return filing procedure along with computation of interest and penalty

CO 4: Specific provisions of Integrated Goods and Service Tax Act, 2017.

UCMABAF504

International Finance

Learners will be able to:

CO1: Familiarize with the fundamental aspects of various issues associated with International Finance

CO2: Give a comprehensive overview of International Finance as a separate area in International Business

CO3: To introduce the basic concepts, functions, process & techniques

UCMABAF505

Financial Accounting - V

Learner will be able to understand

CO1: Difference between amalgamation, absorption and external reconstruction and its accounting treatment

CO2: Legal procedure and entries for internal reconstruction

CO3: Various types of underwriting and computation of underwriters liability.

CO4: Order of payment in case of liquidation and preparation of liquidators final statement.

CO5: Conditions, sources and legal procedure and entries for buyback

UCMABAF506

Financial Accounting – VI

Learners should be able to

CO 1: To learn the accounting for Banking, Insurance Companies and Co-op Society

- CO 2: To familiarise with the methods of valuation of Investment
- CO 3: To understand the accounting for LLP

SEMESTER VI

UCMABAF601

Cost Accounting - IV

Learners should be able

- CO 1: To familiarise with the methods of Budgeting
- CO 2: To learn the accounting for Absorption costing and Marginal Costing
- CO 3: To understand the concepts of Managerial Decision Making, Standard Costing

UCMABAF602

Financial Management - III

Learners should be able to

- CO1: Understand the conceptual framework of valuation and approaches to valuation
- CO2: Understand the concept of mergers and acquisition and learn the bases of exchange ratios
- CO3: Determine the basic modes of mergers and acquisition and reasons for failure or success
- CO4: Learn the concept of corporate restructuring and takeovers
- CO5: Financing modes of Lease, hire purchase and working capital

UCMABAF603

Taxation - Paper I V (Indirect Taxes – III)

Learner will be able to,

- CO 1: Apply the rules related to payment and refund of tax under GST provisions
- CO 2: Filing of returns and related provisions
- CO 3: Maintain accounts and understand audit norms
- CO 4: Understand provisions under Customs Act.

UCMABAF604

Security Analysis and Portfolio Management

On the successful completion of this course the learner will be able to:

- CO 1: Understand the various alternatives available for investment.
- CO 2: Learn to measure risk and return.
- CO 3: Find the relationship between risk and return.
- CO 4: Gain knowledge of the various strategies followed by investment practitioners

UCMABAF605 -Financial Accounting – VII

Learners should be able to

- CO 1: Prepare books of accounts for Electricity Company and Co-operative Society
- CO 2: Understand the procedure for accounting for investment
- CO 3: To acquire the ability to integrate and solve problems in practical scenarios on Accounting Standards for deciding the appropriate accounting treatment and formulating suitable accounting policies

UCMABAFP61

Project Work

Learners will be able to:

CO 1: Apply research methodology in solving research problem

CO 2: Do analysis and give interpretation and recommendation

CO 3: Prepare Project report

Bachelor of Commerce (Financial Markets) Programme Outcomes

Towards the end of this programme, learners will be able to:

- PO1:** Develop effective communication skills both oral as well as written and including business communication skills
- PO2:** Appreciate and understand importance of working independently and in a team
- PO3:** Understand legal aspects of business and corporate sector
- PO4:** Understand and solve complex accountancy and finance problems
- PO5:** Make effective use of IT tools in all aspects of business
- PO6:** Understand required mathematical, analytical and statistical tools for financial and accounting analysis
- PO7:** Understand various commerce functions such as accounting, Finance, taxation etc.
- PO8:** Understand economic environment of business
- PO9:** Develop awareness about social and environmental issues affecting business

Programme Specific Outcomes

Bachelor of Commerce (Financial Markets) (B. F. M.)

Towards the end of this programme, learners will be able to:

- PSO1:** Apply the knowledge of Accounting and Finance in Financial Services Sector
- PSO2:** Know the structure and importance of Indian Financial System
- PSO3:** Understand the working of different financial markets- Equity, Debt, Derivatives, Commodities, Foreign Exchange
- PSO4:** Identify the relevance of Investing & Financial Planning
- PSO5:** Accumulate knowledge of the various financial services offered in India
- PSO6:** Identify the advantages and importance of various Financial Instruments such as shares, debt instruments, Derivatives, G-Sec, Mutual Funds etc.
- PSO7:** Analyse and understand the importance of risk management in finance as well as relationship between risk and return

SEMESTER I

UCMABFM101 - FINANCIAL ACCOUNTING- I

Learners will be able to:

- CO1:** To understand proper identification, recording, classification and summarization of business transactions.
- CO2:** To understand the computation of Profit/Loss for the year and to know the Financial position of business
- CO3:** To understand how to classify the expenditures and receipts
- CO4:** To understand how to analyse and interpretate the accounts in order to improve the profitability and performance in future.

UCMABFM102

BUSINESS MATHEMATICS

Learners will be able to:

- CO1:** Understand Ratios, Simple and Compound Interest, Linear Programming techniques
- CO2:** Apply the theory in real business scenarios
- CO3:** Understand various statistical methods.

UCMABFM103

MICRO ECONOMICS

Learners will be able to:

CO1: Understand the different theories in Economics

CO2: Apply the theory in real business scenarios

CO3: Understand the economic issues and problems faced by individuals, organisations and society.

CO4: Getting a managers perspective business

UCMABFM104

INTRODUCTION TO FINANCIAL SYSTEM

Learners will be able to:

CO1: Upon completion, Learners should be able to work as contributing members of a team in any area of Financial Services sector.

CO2: Understand the development of financial system

CO3: Apply the theory in real business scenarios

CO4: Understand the history, school of thoughts and evolution of banks and Insurance sector.

CO5: Getting a managers perspective business

CO6: Learn the functions and process of banking and insurance sector

UCMABFM105

BUSINESS ENVIRONMENT

Learners will be able to:

CO1:To understand the relationship between business and its environmenrs

CO2:To understand the concepts of PESTEL Analysis, SWOT Analysis

CO3:To understand the Contemporary Issues relating to businesses in India.

CO4:To understand the effect of international environments on businesses in India

UCMABFM106

BUSINESS COMMUNICATION

Learners will be able to:

CO1:Understand growing need for communication skills in a rapidly changing world.

CO2:Apply communication skills in corporate.

UCMABFM107

FOUNDATION COURSE – I

Learners will be able to:

CO1:To understand the multi-cultural diversity of Indian society

CO2:To understand the concept of disparity as arising out of stratification and inequality the causes and effects of conflicts arising out of regionalism and linguistic differences

CO3:To understand the philosophy of the Constitution, its structure, Fundamental Duties of the Indian Citizen; tolerance, peace and communal harmony as crucial values in strengthening the social fabric of Indian society

CO4:To understand the party system in Indian politics, local self-government in urban and rural areas, the 73rd and 74th Amendments and their implications for inclusive politics, Role and significance of women in politics

SEMESTER II

UCMABFM201

FINANCIAL ACCOUNTING- II

Learners will be able to:

CO1:To understand proper identification, recording, classification and summarization of business transactions.

CO2:To understand the computation of Profit/Loss for the year and to know the Financial position of business

CO3:To understand how to classify the expenditures and receipts

CO4:To understand how to analyse and interpretate the accounts in order to improve the profitability and performance in future.

UCMABFM202

BUSINESS STATISTICS

Learners will be able to:

CO1:Understand the Measures of central tendency, probability and dispersion.

CO2:Apply the theory in real business scenarios

CO3:Understand various statistical methods.

UCMABFM203

MACRO ECONOMICS

Learners will be able to:

CO1: Understand the different theories in Economics

CO2: Apply the theory in real business scenarios

CO3: Understand the economic issues and problems faced by individuals, organisations and society.

UCMABFM204

BUSINESS LAW

Learners will be able to:

CO1: Understand Business Law.

CO2: Understand various Acts and its applicability in real life.

CO3: Getting legal perspective in business

UCMABFM205

PRINCIPLES OF MANAGEMENT

Learners will be able to:

CO1:Understand the theory of management

CO2:Apply the theory in real business scenarios

CO3:Understand the history, school of thoughts and evolution of management

CO4:Getting a managers perspective business

CO5:Learn the functions and process of management

CO6:Appreciate the contribution of management in the working of a company

UCMABFM206

ORGANISATION BEHAVIOUR

Learners will be able to:

CO1: Understand the Organisation Behaviour concept.

CO2: Understand the Interpersonal relationships, Group Behaviour and Group Dynamics, Stress Management, Change and Team Building

UCMABFM207

FOUNDATION COURSE –II

Learners will be able to:

CO1: To understand the impact of globalization on Indian society

CO2: To understand the concept of Human Rights and its constituents with special reference to Fundamental Rights stated in the Constitution

CO3: To understand the causes and impact of Environmental Degradation on human life

CO4: To manage stress and conflict in contemporary society

SEMESTER III

UCMABFM301

MANAGEMENT ACCOUNTING

Learners will be able to:

CO1: Understand the Role of Management Accounting in decision making

CO2: Understand the Ratio analysis and interpretation.

CO3: Understand the Preparation of cash flow statements with reference to Accounting Standard No 3.

CO4: Understand the Estimation of working capital requirements.

UCMABFM302

EQUITY MARKETS- I

Course Outcomes: Learners will be able to:

CO1: Understand the Growth of Corporate Sector and the simultaneous growth in the number of equity shareholders, Separation of ownership and management in companies

CO2: Understand the Book Building, Offer for sale, Role of Merchant bankers in fixing the price, Red – Herring Prospectus – it's unique features, ASBA and its features

CO3: To understand the Evolution and Growth of Stock Exchanges in India, NSE, BSE, SME Exchanges and Overseas Stock Exchanges, Recent Development in Stock Exchanges

CO4: To understand the need for strengthening secondary markets, Link between Primary Market and Secondary Market.

UCMABFM303

CORPORATE FINANCE

Learners will be able to:

CO1: Understand the concept of Corporate Finance & corporate Financial Activities

CO2: Understand the Capital Structure & Sources and Methods of Raising Corporate Finance.

UCMABFM304

STRATEGIC MANAGEMENT

Learners will be able to:

CO1: Understand the concept of Introduction & Strategy formulation of Strategic management.

CO2: Understand the Strategic Implementation & Strategic Evaluation & Control

UCMABFM305

COMPUTER APPLICATIONS IN INVESTMENTS

Learners will be able to:

CO1: Understand the working of Advanced Spreadsheet & Data Based Management Systems

CO2: Understand the Modern E Business Software System & Other emerging technologies

UCMABFM306

FOUNDATION COURSE- III- DEBT AND MONEY MARKET

Learners will be able to:

CO1: Understand the working of Introduction to Debt Market & Instruments in Debt Market and Bond Valuation

CO2: Understand the Money Market Instrument & Recent Development in Money Markets

SEMESTER IV

UCMABFM401

COST ACCOUNTING

Learners will be able to

CO1: Express the place and role of cost accounting in the modern economic environment

CO2: Select the costs according to their impact on business,

CO3: Differentiate methods of schedule costs per unit of production

CO4: Differentiate methods of calculating stock consumption

CO5: Interpret the impact of the selected costs method

CO6: Identify the specifics of different costing methods

UCMABFM402

EQUITY MARKETS- II

Learners will be able to:

CO1: Understand the concept of Equity Market & Valuation of Equities

CO2: Understand the Statistical Analysis of Share price movement & Dealings in Stock Exchanges

UCMABFM403

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

On the successful completion of this course the student will be able to:

CO1: Understand the various alternatives available for investment.

CO2: Learn to measure risk and return.

CO3: Find the relationship between risk and return.

CO4: Value the equities and bonds.

CO5: Gain knowledge of the various strategies followed by investment practitioners

UCMABFM404

MARKETING OF FINANCIAL SERVICES

On the successful completion of this course the student will be able to:

CO1: Issues in Marketing of Services

CO2: Customer Satisfaction & Service Quality in Service Marketing

UCMABFM405

RESEARCH METHEDODOLOGY

Learners will be able to:

- CO1:** Understand the concept of Fundamentals of Research & defining the research problem
- CO2:** Understand the importance and types and Formulation of hypothesis and testing of hypothesis.

UCMABFM406

FOUNDATION COURSE IN FINANCIAL MARKETS FC IV – FOREIGN EXCHANGE MARKETS

Learners will be able to:

- CO1:** Understand the Foreign Exchange Market & Indian Foreign Exchange Market
- CO2:** Understand the Operational aspects of foreign exchange market and foreign exchange contracts & Foreign Exchange Arithmetic and Risk Management.

SEMESTER V

UCMABFM501

Technical Analysis

Learners will be able to:

- CO1:** Understand the concept of Technical Analysis & Indicators and Oscillators.
- CO2:** Understand the Major Theories in Technical Analysis, Risk Management, Trading Psychology and Trading Strategies.

UCMABFM502

Wealth Management

Learners will be able to:

- CO1:** Understand the Wealth Management & Wealth Management Strategies
- CO2:** Understand the Financial Planning, Financial Mathematics, Retirement & Estate Planning.

UCMABFM503

Direct Tax- Income Tax

Learners will be able to:

- CO1:** Understand the Definitions and Residential Status & Heads of Income
- CO2:** Understand the Computation of Total Income & Taxable Income & GST.

UCMABFM504

Business Ethics & Corporate Governance

Learners will be able to:

- CO1:** Understand the Ethics and Business Ethics, Ethics in Marketing, Finance and HRM
- CO2:** Understand the Corporate Governance & CSR

UCMABFM505

Financial Derivatives

Learners will be able to:

- CO1:** Understand the Derivatives, Futures and options.
- CO2:** Understand the Pricing of Future Options, Trading Clearing and Settlement of Options and Futures.

UCMABFMP51

Project I

Learners will be able to:

CO 1: Apply research methodology in identifying a research problem

CO 2: Collect data, do analysis and give interpretation and recommendation

SEMESTER VI

UCMABFM601

Venture Capital and Private Equity

Learners will be able to:

CO1: Understand the of understanding of Venture Capital and Private Equity, Structure and Valuation approaches

CO2: Understand the Strategies of Private Equity & Exit strategies for Private Equity

UCMABFM602

Mutual Fund Management

Learners will be able to:

CO1: Understand the Mutual Fund Organization, Management & Mutual Fund Products

CO2: Understand the Investment and Performance Measurement & Accounting and Taxation of Mutual Funds

UCMABFM603

Strategic Corporate Finance

Learners will be able to:

CO1: Understand the Strategic Corporate Finance & Fund raising

CO2: Understand the Company Valuation & Credit Risk Management

UCMABFM604

Organisational Behaviour

Learners will be able to:

CO1: Understand the Organisation Behaviour concept.

CO2: Understand the Interpersonal relationships, Group Behaviour and Group Dynamics, Stress Management, Change and Team Building

UCMABFM605

Risk Management

Learners will be able to:

CO1: Understand the Risk Management & Evaluation of Risk

CO2: Understand the Foreign Exchange Risk & Exchange Rate Risk

UCMABFMP61

Project II

Learners will be able to:

CO 1: Apply research methodology in identifying a research problem

CO 2: Collect data, do analysis and give interpretation and recommendation

BACHELOR OF COMMERCE (BANKING & INSURANCE)

Programme Outcome

Bachelor of Commerce

Towards the end of this programme, learners will be able to:

- PO1.** To build a strong foundation of knowledge in different areas of Commerce.
- PO2.** To develop the skill of applying concepts and techniques used in Commerce.
- PO3.** To develop an attitude for working effectively and efficiently in a business environment.
- PO4.** To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students.
- PO5.** To expose students about entrepreneurship.
- PO6.** To enable a student to be capable of making decisions at personal and professional level.
- PO7.** Develop effective communication skills both oral as well as written and including business communication skills
- PO8.** Appreciate and understand importance of working independently and in a team
- PO9.** Understand legal aspects of business and corporate sector
- PO10.** Understand and solve complex accountancy and finance problems
- PO11.** Make effective use of IT tools in all aspects of business
- PO12.** Understand required mathematical, analytical and statistical tools for financial and accounting analysis
- PO13.** Understand various commerce functions such as accounting, Finance, taxation etc.
- PO14.** Understand economic environment of business
- PO15.** Develop awareness about social and environmental issues affecting business

Programme Specific Outcome

Bachelor of Commerce (Banking & Insurance) (B. B. I.)

Towards the end of this programme, learners will be able to:

- PSO1.** Critically understand the theories, concepts and legal implications related to finance, banking and insurance subject areas.
- PSO2.** To aim to familiarize Banking & Insurance system in India.
- PSO3.** To create awareness about modern banking services like e-banking, m-banking and internet banking.
- PSO4.** Have an exposure of the techniques & application of contemporary banking.
- PSO5.** Learn about the basic concepts of Risk and Insurance
- PSO6.** Know about the fundamental principles of Insurance and about the various

classifications of Insurance.

PSO7. Familiarize themselves with major insurance products, such as life insurance, health insurance, property and liability insurance.

PSO8. Develop skills to facilitate insurance product cost and pricing, marketing and distribution.

Semester 1

UCMABBI101

Business Economics – I

Learner will be able to:

CO 1: Understand the different theories in Economics.

CO 2: Apply the theory in real business scenarios.

CO 3: Understand the economic issues and problems faced by individuals, organisations and society.

CO 4: Getting a manager's perspective business.

UCMABBI102

Quantative Methods-I

Learner will be able to:

CO1: Understand the Measures of central tendency, probability and dispersion.

CO 2: Apply the theory in real business scenarios.

CO 3: Understand various statistical methods.

UCMAPI103

Environment and Management of Financial Services

Learner will be able to:

CO1: Understand the development of financial system.

CO2: Apply the theory in real business scenarios.

CO3: Understand the history, school of thoughts and evolution of banks and Insurance sector.

CO 4: Getting a manager's perspective business

CO 5: Learn the functions and process of banking and insurance sector.

UCMABBI104

Principles of Management

Learner will be able to:

CO 1: Understand the theory of management.

CO 2: Apply the theory in real business scenarios.

CO 3: Understand the history, school of thoughts and evolution of management.

CO 4: Getting a manager's perspective business.

CO 5: Learn the functions and process of management.

UCMABBI105

Financial Accounting - I

Learner will be able to:

CO 1: Understand the theory of accounting.

CO 2: Apply accounting concepts in real business scenarios.

CO 3: Apply critical thinking skill in analyzing financial data.

CO 4: To understand the effect different financial accounting methods on Financial Statement.

UCMABBI106

Business Communication

Learner will be able to:

CO 1: Understand growing need for communication skills in a rapidly changing world.

CO 2: Apply communication skills in corporate.

UCMABBI107

Indian Contemporary Issues (Foundation Course)

Learner will be able to:

CO 1: Understand Indian Society.

CO 2: Understand concept of disparity.

CO 3: Understand Indian Constitution.

CO 4: Understand significant aspects of Political Process.

SEMESTER 2

UCMABBI201

Organisational Behaviour

Learner will be able to:

CO 1: Understand the development and analyse organizational behaviour issues in context of organizational behavioural theories, model & concepts.

CO 2: Apply the theory in real business scenarios.

CO 3: To discuss the development of the field of organizational behaviour and explain the micro and macro approach.

CO 4: Getting a manager's perspective business.

CO 5: Learn the functions and discuss the implementation of organizational changes.

UCMABBI202

Quantative Methods-II

Learner will be able to:

CO1: Understand the Measures of central tendency, probability and dispersion.

CO 2: Apply the theory in real business scenarios.

CO 3: Understand various statistical methods.

UCMABBI203

Principles and Practices of Banking & Insurance

Learner will be able to:

CO 1: Understand the development of financial system.

CO 2: Apply the theory in real business scenarios.

CO 3: Understand the history, school of thoughts and evolution of banks and Insurance sector.

CO 4: Getting a manager's perspective business.

CO 5: Learn the functions and process of banking and insurance sector.

UCMABBI204

Business Law

Learner will be able to:

CO 1: Understand Business Law.

CO 2: Understand various Acts and its applicability in real life.

CO 3: Getting legal perspective in business.

UCMABBI205

Financial Accounting - II

Learner will be able to:

CO 1: Understand the theory of accounting.

CO 2: Apply accounting concepts in real business scenarios.

CO 3: Apply critical thinking skill in analyzing financial data.

CO 4: To understand the effect different financial accounting methods on Financial Statement.

UCMABBI206

Entrepreneurship Management

Learner will be able to:

CO 1: Understand growing need for communication skills in a rapidly changing world.

CO 2: Apply communication skills in corporate.

UCMABBI207

Customer Relationship Management

Learner will be able to:

CO 1: Understand Liberalization and globalization.

CO 2: Understand Ecology and Human rights.

SEMESTER 3

UCMABBI301

Financial Markets

Learner will be able to:

CO 1: Learner should be able to outline the participants in the financial markets.

CO 2: Learn the functions of primary & secondary markets.

UCMABBI302

Taxation

Learner will be able to:

CO 1: Understand Taxation concept.

CO 2: Learn various Heads of Income.

CO 3: Calculate Computation of Tax liability.

CO 4: Learn GST.

UCMABBI303

Management Accounting

Learner will be able to:

CO 1: Assistance in Planning and Formulation of Future Policies.

CO 2: Understanding in the Interpretation of Financial Information.

CO 3: Understand Controlling Performance of the various departments with help of various techniques.

UCMABBI304

Risk Management

Learner will be able to:

CO 1: Define the exposures that constitute the overall risk faced by a firm or enterprise.

CO 2: Discuss the process of managing the various exposures that affect the firm or Enterprise.

UCMABBI305

Mutual Fund Management

Learner will be able to:

CO 1: To understand different types of mutual funds.

CO 2: To understand mutual funds operation.

CO 3: To understand information about how mutual funds perform.

UCMABBI306

Information Technology in Banking & Insurance – I

Learner will be able to:

CO 1: Understand professional, ethical, legal, security and social issues and responsibilities.

CO 2: Be able to use current techniques, skills, and tools necessary for computing Practice.

UCMABBI307

Foundation Course - III (An Overview of Banking Sector)

Learner will be able to:

CO 1: Understand Overview of Banking Sector.

CO 2: Understand commercial Banking, Universal Banking & Current trends in Banking Industry.

SEMESTER 4

UCMABBI401

Corporate & Securities Law

Learner will be able to:

CO 1: Understand Overview of Company Law.

CO 2: Familiarize with SEBI & Depositories Act.

UCMABBI402

Business Economics-II

Learner will be able to:

CO 1: Understand Overview of Macro Economic data & theory.

CO 2: Familiarize with concepts of Inflation, Monetary policy & Fiscal policy.

UCMABBI403

Cost Accounting

Learner will be able to:

CO 1: Express the place and role of cost accounting in the modern economic environment.

CO 2: Select the costs according to their impact on business.

CO 3: Interpret the impact of the selected costs method.

UCMABBI404

Research Methodology

Learner will be able to:

CO 1: Understand concept of Research Methodology.

CO 2: To familiarize with research design, data collection & report writing.

UCMABBI405

Wealth Management

Learner will be able to:

CO 1: To familiarize with the concept of Wealth management strategies.

CO 2: To make students aware about financial planning, financial mathematics, retirement & estate planning.

UCMABBI406

Information Technology in Banking & Insurance – II

Learner will be able to:

CO 1: To familiarize with the concept of E-banking models & Techno Management.

CO 2: To make students aware about IT applications in Banking & MS Office.

UCMABBI407

Foundation Course - IV (An Overview of Insurance Sector)

Course Objective: Learner will be able to:

CO 1: Understand Overview of Insurance Sector.

CO 2: Understand Health, Home & Motor Insurance.

SEMESTER 5

UCMABBI501

International Banking and Finance

Learner will be able to:

CO 1: To understand the concepts and broad activities of International Banking and Finance.

UCMABBI502

Marketing in Banking & Insurance

Learner will be able to:

CO 1: To develop concepts in marketing.

CO 2: To explain the scope of marketing management-analyzing opportunities, selecting target segments, developing the market mix, managing the marketing effort.

CO 3: To provide understanding of the communication mix, advertising campaigns, media planning, budgeting, marketing mix decisions, scope and limitations of market research.

CO 4: To develop strong concepts in marketing strategies for emerging technology and mature markets.

CO 5: Provide understanding about the internet as a strategic medium for marketing and sales efforts for a company.

UCMABBI503

Financial Reporting and Analysis

Learner will be able to:

CO 1: To analyze financial information.

CO 2: To understand the relationship between strategic business analysis, accounting analysis and financial analysis.

CO 3: To understand the impact of financial reporting choices on the usefulness of reported earnings to predict future performance.

CO 4: To Recognize and explain the fundamental role of accounting numbers in the valuation of entities and the key financial claims on these entities' assets (equity and debt securities).

UCMABBI504

Paper 4: Auditing

Learner will be able to:

CO 1: Differentiate between auditing and accounting.

CO 2: Explain the three types of audits.

CO 3: Identify the five components of internal control.

CO 4: Describe how information technology affects internal control.

CO 5: Describe the process of designing and performing tests of controls.

CO 6: List the types of substitutive procedures.

CO 7: Explain methods used to obtain an understanding of internal control.

CO 8: Design an audit plan.

CO 9: Describe the five conditions required to issue the standard unqualified audit report.

CO 10: Determine the appropriate audit report for a given audit situation.

UCMABBI505

Actuarial Analysis in Banking & Insurance

Learner will be able to:

CO 1: To develop conceptual understanding in Actuarial Analysis.

CO 2: To explain the scope of Risk Return analysis, Time Value, Reinsurance & Valuation concepts.

SEMESTER 6

UCMABBI601

Central Banking

Learner will be able to:

CO 1: To understand the importance & functions of Central Bank

CO 2: To understand the role of Central Bank in economy.

UCMABBI602

Security Analysis and Portfolio Management

Learner will be able to:

CO 1: To understand the factors affecting the prices of different assets and to create an optimum portfolio based on given risk conditions.

CO 2: To understand the need for continuous evaluation and review of the portfolio with different techniques.

CO 3: To learn technical analysis to predict price movements based on indicators and forecasting techniques.

UCMABBI603

Strategic Management & Turnaround Management

Learner will be able to:

CO 1: To enable to understand need for revival of sick and stressed business unit.

- CO 2:** To make aware of the different turnaround strategies.
- CO 3:** To give an overview of the recent business scenario.
- CO 4:** To develop an understanding of the general and competitive business environments.
- CO 5:** To enable to understand and resolve cases through strategic decision making.
- CO 6:** To develop an understanding of strategic & Turnaround management concepts and techniques.

UCMABBI604

Human resource management and Business Ethics and Corporate Governance

Learner will be able to:

- CO 1:** To understand ethical issues in business and various processes involved in increasing the value of human assets.
- CO 2:** To highlight the role of Corporate Governance practices in maintaining Transparency in business transactions.
- CO 3:** To highlight the importance of commitment to values and HRD conduct of Business.
- CO 4:** To increase awareness about the statutory and legal compliances involved in corporate governance.
- CO 5:** To highlight the role of human resources in success of an enterprise.
- CO 6:** To understand ways for maintaining high employees morale and sound human relations by sustaining and improving the various conditions and facilities.

UCMABBI605

Financial Management

Learner will be able to:

- CO 1:** To have conceptual understanding on capital budgeting.
- CO 2:** To understand the need & importance of financial decisions.
- CO 3:** To learn and formulate leverage.

BACHELORS OF MASS MEDIA

Programme Outcome

Towards the end of this programme, learners will be able to:

- PO 1:** Develop effective communication skills both oral as well as written, including business communication skills
- PO 2:** Appreciate and understand importance of working independently and in a team
- PO 3:** Understand communication and media theories and its examination and application in the contemporary world
- PO 4:** Develop an understanding of the history, evolution and the development of Mass Communication in the world with special reference to India
- PO 5:** Make effective use of IT tools in all aspects of business
- PO 6:** Understand economic environment of the media sector
- PO 7:** Develop awareness about social and environmental issues affecting society
- PO 8:** Develop functional and operational use of language in media
- PO 9:** Discuss Mass Media from a sociological perspective

Programme Specific Outcome

Bachelor of Mass Media (B. M. M.)

Towards the end of this programme, learners will be able to:

- PSO 1:** Apply the knowledge of Media theories in Media Sector
- PSO 2:** Know the structure and importance of Indian Media
- PSO 3:** Understand the concept of New Media and Media Convergence and its implications
- PSO 4:** Develop industry knowledge required to make a career in the field of print Advertising, Digital Marketing, Television media, Film etc.
- PSO 5:** Train for software knowledge required in the above-mentioned Industries
- PSO 6 :** Enhance communication and language skills with particular reference to Media communication
- PSO 7:** Use critical thinking to achieve efficiency in oral skills
- PSO 8:** Develop structural and analytical reading, writing and thinking skills

SEMESTER 1

UAMABMM 101

EFFECTIVE COMMUNICATION SKILLS - I

A Learner should be able to:

- CO 1:** Be aware of functional and operational use of language in media
- CO 2:** Understand Structural and analytical reading, writing and thinking skills
- CO 3:** Understand key concepts of communication

UAMABMM 102

FUNDAMENTALS OF MASS COMMUNICATION

A Learner should be able to:

- CO 1:** Understand the history, evolution and the development of Mass Communication in the world with special reference to India
- CO 2:** Understand the evolution of Mass Media as an important social institution
- CO 3:** Understand the development of Mass Communication models
- CO 4:** Understand the concept of New Media and Media Convergence and its implication.

UAMABMM 103

INTRODUCTION TO ECONOMICS

A Learner should be able to:

CO 1: Understand the basic concepts of Micro & Macro Economics

CO 2: Develop analytical skills that will allow them to view the economic scenario critically

UAMABMM 104

HISTORY

A Learner should be able to:

CO 1: Understand the global happenings which have made historical milestones and changing power equations

CO 2: Understand the role of media in these events. (The syllabus spans from global events, refugee problems, humanitarian work, human rights violation, Asian perspective and of course, India)

UAMABMM 105

INTRODUCTION TO SOCIOLOGY

A Learner should be able to:

CO 1: Understand the basic foundations of Sociology

CO 2: Understand the relationship between Sociology and Mass Media

CO 3: Understand the Mass Media from a sociological perspective

CO 4: Understand the need and relevance of Sociology in Mass Media

UAMABMM 106

PRINCIPLES OF MANAGEMENT

A Learner should be able to:

CO 1: Understand the theory of management and apply the theory in real business scenarios

CO 2: Understand the history, school of thought and evolution of management

CO 3: Learn the functions and process of management

UAMABMMP17

ADVANCED COMPUTERS - I

A Learner should be able to:

CO 1: Understand the industry knowledge required to make a career in the field of print and Advertising, Digital Marketing, Television media, Film etc.

CO 2: Understand the software knowledge required in the above-mentioned Industries

SEMESTER 2

UAMABMM 201

EFFECTIVE COMMUNICATION SKILL - II

A Learner should be able to:

CO 1: Enhance communication and language skills with particular reference to Media communication

CO 2: Use critical thinking to achieve efficiency in oral and written skills

UAMABMM 202

INTRODUCTION TO WORLD LITERATURE

A Learner should be able to:

CO 1: Understand the works of good writers and deepen their thinking

CO 2: Explore various genres in Literature to enhance sensitivity and thinking

UAMABMM 203

POLITICAL CONCEPTS AND THE INDIAN POLITICAL CONCEPTS

A Learner should be able to:

CO 1: Understand the fundamental political concepts, political systems and theories

CO 2: Be aware of the Indian Constitution and the functioning of the Indian political system

CO 3: Have a strong base in the 'Indian Political System' and its dynamics and complexities

CO 4: Understand the link between Politics and Media

UAMABMM 204

MASS MEDIA RESEARCH

A Learner should be able to:

CO 1: Understand the basic concept of research, its approaches, its scope and limitations, tools and techniques

CO 2: Understand about concepts and processes of media research.

UAMABMM 205

INTRODUCTION TO MEDIA PSYCHOLOGY

A Learner should be able to:

CO 1: Understand the basic concepts and modern trends in psychology

CO 2: Understand the interdisciplinary study of concepts in the field of media, communication and psychology

CO 3: Understand the multicultural use, influence and impact of media

UAMABMM 206

INTRODUCTION TO MEDIA STUDIES

A Learner should be able to:

CO 1: Understand the well-developed body of media theory and analysis

CO 2: Develop analytical skills that will allow them to view the media critically

UAMABMMP27

ADVANCED COMPUTERS - II

A Learner should be able to:

CO 1: Understand the industry knowledge required to make a career in the field of print and Advertising, Digital Marketing, Television media, Film etc.

CO 2: Develop the software knowledge required in the above-mentioned Industries

SEMESTER 3

UAMABMM 301

CORPORATE COMMUNICATION AND PUBLIC RELATIONS

A Learner should be able to:

CO 1: Understand the basic concepts of Corporate Communication and Public Relations

CO 2: Understand the various elements of Corporate Communication and consider their roles in managing organizations

CO 3: Understand how various elements of Corporate Communication must be coordinated to communicate effectively

CO 4: Develop critical understanding of the different practices associated with Corporate Communication

UAMABMM 302

INTRODUCTION TO CREATIVE WRITING

A Learner should be able to:

- CO 1:** Develop interest to read stories, poems, plays
- CO 2:** Develop further and build upon the writing and analytical skills acquired in Semesters I & II
- CO 3:** Understand the basic concepts in literary writing
- CO 4:** Develop media related writing skills

UAMABMM 303

INTRODUCTIONS TO CULTURAL STUDIES

A Learner should be able to:

- CO 1:** Understand the approaches in the study of culture
- CO 2:** Be aware of cultural theories and its relevance in media
- CO 3:** Understand the importance of cultural studies and its role in mass media
- CO 4:** Understand the how cultural practices have gained their meanings

UAMABMM 304

ORGANISATIONAL BEHAVIOUR

A Learner should be able to:

- CO 1:** Understand the basic concepts and facets of organisational behaviour
- CO 2:** Understand the role of psychological factors & process at work
- CO 3:** Develop management skills and an understanding of organization functions

UAMABMM 305

EVENT MANAGEMENT

A Learner should be able to:

- CO 1:** Understand the role and purpose(s) of special events in the organizations
- CO 2:** Understand the techniques and strategies required to plan successful special events
- CO 3:** Understand the knowledge and competencies required to promote, implement and conduct special events
- CO 4:** Understand the knowledge and competencies required to assess the quality and success of special events

UAMABMMP36

PHOTOGRAPHY AND LIGHTS

A Learner should be able to:

- CO 1:** Understand the world of Photography
- CO 2:** Be aware of Photographs as strong visual communication

SEMESTER 4

UAMABMM 401

FILM APPRECIATION

A Learner should be able to:

- CO 1:** Understand the various styles and schools of cinema throughout the world

UAMABMM 402

INTRODUCTION TO JOURNALISM

A Learner should be able to:

- CO 1:** Understand the influential medium of journalism which holds the key to opinion formation & create awareness

UAMABMM 403

INTEGRATED MARKETING COMMUNICATION

A Learner should be able to:

CO 1: Understand the knowledge about the nature, purpose and complex construction in the planning and execution of an effective Integrated Marketing Communication (IMC) program

CO 2: Understand the various tools of IMC and the importance of coordinating them for an effective marketing communication program

UAMABMM 404

THEATRE AND COMMUNICATION

A Learner should be able to:

CO 1: Develop confidence in movement and speech.

CO 2: Develop concentration and logical organization of ideas thus developing the power of analytical thinking.

CO 3: Develop self-awareness, imagination, creative thinking and expression.

CO 4: Develop aesthetic and artistic awareness

UAMABMM 405

INTRODUCTION TO ADVERTISING

A Learner should be able to:

CO 1: Understand the basic steps in advertising

CO 2: Understand the structure of an Ad Agency and creations of an ad campaign

UAMABMM 406

RADIO AND TELEVISION

A Learner should be able to:

CO 1: Understand the working of two powerful media i.e. Radio and Television

CO 2: Understand the history, evolution and the development of Radio and Television in the world with special reference to India

SEMESTER 5

UAMABMM 501

JOURNALISM AND PUBLIC OPINION

A Learner should be able to:

Course Outcome:

CO 1: Understand the importance of the media vis-a-vis the public

CO 2: Understand the role of the media in creating and influencing Public Opinion

CO 3: Analyse the impact of the media and public opinion on socio political issues

UAMABMM 502

REPORTING AND EDITING

A Learner should be able to:

CO 1: Understand the basic ethos of news and the news-gathering process

CO 2: Develop writing and presentation of the format of news

CO 3: Develop news-gathering skills with traditional as well as modern tools

CO 4: Develop language skills

CO 5: Develop practical knowledge in the print media scenario as well as writing for editions of papers

UAMABMM 503

BRAND BUILDING

A Learner should be able to:

CO 1: Understand the importance of Brand building and its role in marketing

CO 2: Analyze brand building strategies and processes

UAMABMM 504

CONSUMER BEHAVIOUR

A Learner should be able to:

CO 1: Understand the role of marketing in influencing consumer behaviour

CO 2: Analyse the role of marketer & the consumer in advertising

CO 3: Understand the changing trends in consumer behaviour

UAMABMM 505

FINANCIAL MANAGEMENT

A Learner should be able to:

CO 1: Understand the new and existing business and marketing units

CO 2: Understand the need for financial planning through Budgets and their benefits

CO 3: Understand the financial implications of marketing decisions through simple analytical tools

UAMABMMP56

AD DESIGN AND NEWSPAPER & NEWSPAPER MAKING

A Learner should be able to:

CO 1: Understand the art of newspaper and magazine design and be oriented towards the practical aspects of newspaper-magazine making

CO 2: Understand the process of planning & production of advertisements in print and digital format

SEMESTER 6

UAMABMM 601

ENVIRONMENTAL CONCERNS AND CONTEMPORARY ISSUES

A Learner should be able to:

CO 1: Understand and analyse some of the present day environmental, political, economic and social concerns and issues

CO 2: Understand the importance of human rights and its implementation in India

CO 3: Understand the present-day problems and challenges and its implications on development

UAMABMM 602

DIGITAL MEDIA

A Learner should be able to:

CO 1: Understand digital marketing platform

CO 2: Understand the key goals and stages of digital campaigns

CO 3: Understand the use of key digital marketing tools

CO 4: Develop digital marketing plans

UAMABMM 603

DIRECT MARKETING

A Learner should be able to:

CO 1: Understand the concept and importance of Direct Marketing

CO 2: Understand the various techniques of direct marketing and its advantages

UAMABMM 604

MEDIA LAWS

A Learner should be able to:

CO 1: Provide a perspective on the legal environment in India with reference to the media

UAMABMM 605

MEDIA PLANNING AND BUYING

A Learner should be able to:

CO 1: Develop knowledge of various characteristics of media.

CO 2: Understand the procedures, requirements, and techniques of media planning and buying

CO 3: Understand the various media mix and its implementation

CO 4: Understand the budget allocation for a Media plan

UAMABMMP66

INTERNSHIP

A Learner should be able to:

CO 1: Apply the theoretical knowledge gained from classroom setting to the organizational setting

CO 2: Access first-hand experience into the working of an organization

CO 3: Develop and increase employability

B.Sc- BIOCHEMISTRY

Programme Outcomes (PSO's)

On completion of the **B.Sc- Biochemistry**, the learners should be enriched with knowledge and be able to-

- PSO1:** Comprehend biochemical reactions, processes and its significance in an organism
- PSO2:** Understand the fundamental concepts in molecular biology, genetics, immunology, Pathophysiology pharmacology, physiology, Nutrition & Dietetics environmental sciences, Bioinformatics & Biostatistics, Sustainable development, microbiology, recombinant technology, industrial biochemistry & biotechnology, and be abreast with the emerging trends in these fields.
- PSO3:** Optimize process parameters for effective and safe study of biochemical reactions
- PSO4:** Use of modern tools and techniques for the study, design, analysis and synthesis of new biochemical/ pharmaceuticals
- PSO5:** Conduct research under supervision
- PSO6:** Manage scientific information, analyse technical reports and make presentations
- PSO7:** Understanding of the applications of Biochemistry in various fields such as Clinical Biochemistry, Genetic Engineering, Molecular biology & Biotechnology.
- PSO8:** Acquire practical skills that will prepare for a future career in the interdisciplinary subjects

SEMESTER I

USMABCH101

MOLECULES OF LIFE- I

A Learner should be able to:

- CO1:** Understand the structure of water, carbohydrates and nucleotides
- CO2:** List the properties of water, nucleic acid and carbohydrates
- CO3:** Understand the important functions of water, nucleic acids and carbohydrates in biological systems
- CO4:** Appreciate the chemical nature as well as reactions of biomolecules in a biological system
- CO5:** Gain knowledge with respect to the subject and its applicability
- CO6:** Develop their ability to apply the knowledge of Biochemistry in day to day life

USMABCH102

INTRODUCTION TO CELL BIOLOGY

A Learner should be able to:

- CO1:** Comprehend theories proposed to explain origin of life and cell as a functional unit
- CO2:** Appreciate the process of evolution
- CO3:** Get acquainted with the contribution of biochemists to the field of science and also appreciate the interdisciplinary scope of biochemistry
- CO4:** Appreciate the complexity of eukaryotic cells in comparison to prokaryotes
- CO5:** Develop a detailed understanding about the structure and function of plasma membrane, cell wall, nucleus as well as different cell organelles and cytoskeletal components viz.- Mitochondrion, chloroplast, Endoplasmic reticulum, golgi apparatus, lysosome and peroxisomes
- CO6:** Comprehend the basics of different types of transport processes
- CO7:** Understand the detailed process of mitosis and meiosis
- CO8:** Gain insight into the process of apoptosis and necrosis

SEMESTER–II

USMABCH201

MOLECULES OF LIFE II

A Learner should be able to:

- CO1:** Understand the structure of amino acids, proteins and lipids
- CO2:** List the properties of amino acids, proteins and lipids
- CO3:** Understand the important functions of amino acids, proteins and lipids in biological systems
- CO4:** Appreciate the chemical nature as well as reactions of biomolecules in a biological system
- CO5:** Gain knowledge with respect to the subject and its applicability
- CO6:** Develop their ability to apply the knowledge of biochemistry in day to day life

USMABCH202

BIOPHYSICAL CHEMISTRY AND MICROBIOLOGY

A Learner should be able to:

- CO1:** Appreciate the physicochemical principles and their applications in biological systems
- CO2:** Get an insight into various techniques of biochemical investigations
- CO3:** Gain knowledge about the various model organisms used for study
- CO4:** Gain insight into the field of microbiology
- CO5:** Understand the basis of classification of bacteria, staining techniques, nutrition for bacterial growth, methods to measure growth yield and also appreciate the special class of microorganisms viz. extremophiles

SEMESTER III

USMABCH301

FUNDAMENTALS OF APPLIED BIOCHEMISTRY AND PHARMACOLOGY

A Learner should be able to:

- CO1:** List the functions and significance of vitamins and minerals.
- CO2:** Understand the classification and nomenclature of drugs.
- CO3:** Get acquainted with different dosage forms, routes of administration and factors affecting the same.
- CO4:** Comprehend the concept of pharmacokinetics, pharmacogenomics, and tolerance
- CO5:** Get insight into novel drug delivery systems
- CO6:** Gather details regarding active and passive transport and their types.
- CO7:** Gain knowledge on mechanism of transport of blood gases and correlation with blood pH.
- CO8:** Understand the role of proteins in transport, including calcium and iron
- CO9:** Appreciate the significance of electrolytes in normal physiology

USMABCH302

Paper-II - PHYSIOLOGY -I

COURSE OUTCOMES

A Learner should be able to:

- CO1:** Get acquainted with the sequence of steps for digestion of food and absorption of nutrients through the digestive tract.
- CO2:** Identify the role of enzymes in digestion

- CO3:** Understand how nutrients are circulated through and eliminated from the body.
- CO4:** Identify factors that influence digestion, absorption and nutrient transport in the body.
- CO5:** Examine common nutritional and digestive system disorders for their root causes.
- CO6:** Understand the hierarchical organization of human endocrine system.
- CO7:** List the functions of human and plant hormones and their applications.

USMABCH303

FUNDAMENTALS OF TISSUE CULTURE, VIROLOGY AND INDUSTRIAL BIOTECHNOLOGY

A Learner should be able to:

- CO1:** Comprehend the concept of sterilization, stem cell culture, callus regeneration, protoplast fusion, organ culture, micropropagation in tissue culture and its applications
- CO2:** Get insight into fermentation aspects like screening, preparation of inoculum and media
- CO3:** Understand the construction, working, and principle of different types of fermentors
- CO4:** Appreciate the importance of aeration, sterilization, agitation during fermentation
- CO5:** Understand the structure and life cycle (lytic and lysogenic) of virus
- CO6:** List the methods of enzyme immobilization
- CO7:** Gain knowledge into biosensors and single cell proteins – features, construction, development, types and applications.

SEMESTER IV

USMABCH401

INTRODUCTION TO ENZYMOLOGY, RESEARCH METHODS AND TECHNIQUES

A Learner should be able to:

- CO1:** Understand the classification and nomenclature associated with enzyme biochemistry
- CO2:** Gain knowledge of factors affecting enzyme activity and inhibition
- CO3:** Derive Michaelis-menton equation and Lineweaver-Burk plot for monosubstrate reactions and solve numerical based on the same
- CO4:** Understand various laws related to research works carried in and out of country.
- CO5:** Identify the overall process of designing a research study from its inception to its report.
- CO6:** Familiarize with how to write a good research project.
- CO7:** Comprehend the underlying principle behind different types of microscopy.
- CO8:** Get insight into construction, magnification, role of refractive index and light in microscopy.

USMABCH402

PHYSIOLOGY-II

A Learner should be able to:

- CO1:** Appreciate the complexity of the nervous system – including its classification and its components
- CO2:** Understand the concepts of resting membrane potential, depolarization, repolarization, refraction period, action potential
- CO3:** Get insight into anatomy of a synapse, impulse transmission
- CO4:** Differentiate between types of movement and locomotion
- CO5:** Comprehend the process of muscle contraction and relaxation

- CO6:** Get insight into movement in plants and its types
- CO7:** Understand the types of movement in lower organisms and associated organs
- CO8:** Explain anatomy and physiology of heart.
- CO9:** Discuss the composition and functions of biological fluids like bile and bile pigments, urine, lymph, CSF, tears etc.

USMABCH403

GENETICS AND APPLIED BIOTECHNOLOGY

A Learner should be able to:

- CO1:** Get acquainted with Mendelian and non-Mendelian genetics
- CO2:** Comprehend concepts like co-dominance, epistasis, maternal effects and multiple alleles.
- CO3:** Identify the mode of inheritance and determine probabilities of specific genotypes based on pedigree analysis.
- CO4:** Understand the structure and different levels of organization of DNA molecule.
- CO5:** Get insight into different ways of transfer of genetic information takes place between bacterial cells – transformation, transduction and conjugation.
- CO6:** Understand bioremediation, its types and associated factors
- CO7:** Get knowledge of application of bio-pesticides, bio-fungicide and bio-fertilizers

SEMESTER V

USMABCH501

METABOLISM & ANALYTICAL TECHNIQUES-I

A Learner should be able to:

- CO1:** Explain the role of catabolic and anabolic pathways in cellular metabolism
- CO2:** Understand in general terms how cells obtain the energy to do cellular work
- CO3:** Explain how ATP is generated from performs cellular work
- CO4:** Compare energetics of aerobic and anaerobic respiration
- CO5:** Apply the principles of chromatography and spectrophotometer
- CO6:** Describe the methods used in the analysis of compounds
- CO7:** Demonstrate the operation chromatography and spectrophotometer
- CO8:** Explain the chemistry behind the methods of analysis of compounds
- CO9:** Identify which method is more effective for analysis of compounds
- CO10:** Enumerate the examples of enzymes reflecting organ pathophysiology
- CO11:** Recognize enzymes useful in diagnosis of various diseases

USMABCH502

RESEARCH METHODOLOGY, IPR AND PHARMACOLOGY

A Learner should be able to:

- CO1:** Appreciate their rights for the protection of their invention done in their project work
- CO2:** Understand various laws related to research works carried in and out of country
- CO3:** Identify the overall process of designing a research study from its inception to its report
- CO4:** Familiarize with how to write a good research project
- CO5:** Utilize critical thinking skills in discussing the concept of pharmacotherapy.
- CO6:** Understand basic concepts of pharmacogenomics
- CO7:** Discuss the various types of responses that individuals may have to drugs
- CO8:** Identify and discuss “at risk” populations such as the fetus, infants, children, elderly and those with liver and kidney disease for drug-related adverse effects

USMABCH503

ADVANCED GENETICS & RDT

A Learner should be able to:

- CO1:** Understand the basic rules governing replication
- CO2:** Explain the formation and regulation of synthesis of proteins
- CO3:** Illustrate creative use of modern tools and techniques for manipulation and analysis of genomic sequences
- CO4:** Apply recombinant DNA technology in biotechnological research.
- CO5:** Be trained in strategizing research methodologies employing genetic engineering techniques

USMABCH504

IMMUNOLOGY AND PATHOPHYSIOLOGY- I

A Learner should be able to:

- CO1:** Understand the overall organization of the immune system
- CO2:** Appreciate the structure and function of antibodies
- CO3:** Understand the relationship between the innate and adaptive systems
- CO4:** Explain humoral and cellular immunity and their relative significances to transfusion science theory and practice
- CO5:** Learn the normal and abnormal metabolic pathways of bio-molecules (carbohydrates, proteins, lipids)
- CO6:** Describe the roles of cytokines, chemokines, and colony-stimulating factors in the immune response
- CO7:** Acquire the most important diseases related to carbohydrates, proteins, lipids abnormalities
- CO8:** Be aware of various metabolic disorders and in born errors
- CO9:** Discuss pathophysiology and etiology of different diseases
- CO10:** Understand basic aspects of cancer biology
- CO11:** Familiarize with elementary facets of carcinogenesis and types of cancer along with therapy to treat the cancer

USMABCHAC501

FOOD NUTRITION AND DIETETICS-I

A Learner should be able to:

- CO1:** Correlate microorganisms with health and disease
- CO2:** Independently examine and assess nutrient intake, nutritional status and nutrient requirements
- CO3:** Plan and manage the nutritional needs of different groups in society and the ability to educate and inform about diet and health
- CO4:** Grasp the basic concept of therapeutic diet and diet planning
- CO5:** Learn prevention, investigation, assessment, treatment and evaluation of nutrition-related problems, symptoms and disease.

SEMESTER VI

USMABCH601

METABOLISM & ANALYTICAL TECHNIQUES-II

A Learner should be able to:

- CO1:** Understand the operation of the major trans membrane ion pumps and the ATP synthase

- CO2:** Explain the concept of energy, cite examples and assess its importance to living organisms
- CO3:** Explain the chemiosmotic hypothesis of ATP synthesis
- CO4:** Explain the general reaction for photosynthesis in terms of water, light, oxygen and carbon dioxide and carbohydrate
- CO5:** Explain the role of catabolic and anabolic pathways of amino acids , proteins and nucleic acids in cellular metabolism
- CO6:** Understand in general terms how cells obtain the energy to do cellular work.
- CO7:** Explain how ATP is generated from performs cellular work
- CO8:** Apply the principles of centrifugation, radioactivity and electrophoresis.
- CO9:** Demonstrate the operation centrifugation and electrophoresis
- CO10:** Explain the chemistry behind the methods of analysis of compounds

USMABCH602

ENVIRONMENTAL SCIENCE

A Learner should be able to:

- CO1:** Develop a sense of community responsibility by becoming aware of scientific issues in the larger social context
- CO2:** Pursue meaningful careers and post-graduate education in fields related to environmental science and beyond.

USMABCH603

BIOSTATISTICS & BIOINFORMATICS

A Learner should be able to:

- CO1:** Demonstrate an understanding of the central concepts of modern statistical theory and their probabilistic foundation
- CO2:** Understand and use mathematical and statistical theory underlying the application of bio statistical methods
- CO3:** Interpret statistical results correctly, effectively, and in context
- CO4:** Define and apply null hypothesis, alternative hypothesis, level of significance, test statistic, p value, and statistical significance
- CO5:** Make appropriate use of statistical software
- CO6:** Interpret relationships among living things and analyze and solve biological problems, from the molecular to ecosystem level using basic biological concepts, grounded in foundational theories with the help of bioinformatics tools
- CO7:** Apply existing software effectively to extract information from large databases and to use this information in computer modeling

USMABCH604

IMMUNOLOGY & PATHOPHYSIOLOGY-II

A Learner should be able to:

- CO1:** Describe the three pathways that activate the complement system
- CO2:** Explicate the mechanism and consequences of the activation of the complement system
- CO3:** Explain the MHC; its structure and classes, specific role of each class of MHC
- CO4:** Relate the importance of MHC in immune response and graft rejection
- CO5:** Characterize the significance and function of major histocompatibility complex molecules
- CO6:** Grasp a contemporary understanding of classification, structure and mechanism of replication of viruses

- CO7:** Understand the pathophysiology, symptoms and preventive measures of AIDS
- CO8:** Describe the basic concepts of demography and epidemiology of aging
- CO9:** Identify the important concepts of pathophysiology and issues in common diseases of older people

USMABCHAC601

FOOD NUTRITION AND DIETETICS-II

A Learner should be able to:

- CO1:** Define, classify and characterize different components of food other than essential nutrients
- CO2:** Demonstrate the ability to initiate and use new methods in the field
- CO3:** Understand the significance of diet in various pathophysiological conditions
- CO4:** Understand general principles, methods, techniques associated with food preservation
- CO5:** Apply the knowledge for better employability in QA/QC
- CO6:** Understand adulteration in food and its health hazards
- CO7:** Explain food safety and different legal aspects for the same

M.Sc- Biochemistry

Program Specific Outcomes:

On completion of the **M.Sc- Biochemistry**, the learners should be enriched with knowledge and be able to-

- PSO1:** Gain in depth scientific knowledge in the wide-ranging fields as Cell biology, , Metabolism, Clinical & Diagnostic Biochemistry, Pharmacology, Endocrinology, Genetics, Nutrition & Dietetics, Immunology, Enzymology, Genetic engineering, Nanotechnology, Industrially useful biomolecules, Industrial biochemistry & Biotechnology, Biostatistics, Bioinformatics.
- PSO2:** Describe and express the biochemical basis of human diseases, protein structure and conformation, non-invasive diagnostics, biochemical pathway regulation and drug development and its laboratory application
- PSO3:** Integrate and apply the techniques in Biophysics, Analytical biochemistry, Clinical biochemistry, Microbiology, Molecular biology and Basics in bioinformatics.
- PSO4:** Developments of analytical and cognitive skills in Biochemistry and allied sciences that allow independent exploration of biological science through research methods.
- PSO5:** Appreciate the impact of biological sciences on society.
- PSO6:** Enrichment of skills for employability and entrepreneurship through academic, research and internship opportunities
- PSO7:** Exposure to research through the research project.
- PSO8:** Acquire necessary knowledge and skills to undertake a career in research, industry or in an academic set up.

PSMABCH101

Advanced Bio-organic Chemistry-I

At the end of the course, a Learner should be able to:

- CO1:** Understand the outline of major theories underlying origin of life and transitions in evolution from prokaryotes to eukaryotes
- CO2:** Explain the concept of energy, cite examples and assess its importance to living organisms.
- CO3:** Relate the concept of entropy to the Laws of Thermodynamics and discuss the factors that make ATP a suitable energy store for living organisms
- CO4:** Describe the primary function of the electron transport chain and also explain the location and organization of its four different complexes.
- CO5:** Understand how energy is transferred during electron transport and explain the consequences of disrupting electron transport via DNP, cyanide, and other electron transport uncouplers and inhibitors.
- CO6:** Describe/recognize amino acid structure and describe their physical and chemical properties and comprehend primary, secondary, tertiary and quaternary structure in proteins and identify the types of interactions important in each case.
- CO7:** Describe structure, functions and the mechanisms of action of enzymes.
- CO8:** Learn kinetics of enzyme catalyzed reactions and enzyme inhibitory and regulatory processes.
- CO9:** Comprehend wide applications of enzymes and their future potential.
- CO10:** Understand how the biochemical and biophysical properties of membranes constituents contribute to the structure and organisation of membranes
- CO11:** Understand the basic principles of signal transduction mechanisms, in particular the concepts of response specificity, signal amplitude and duration, signal integration and intracellular location

CO12: Give examples of different types of extracellular signals and receptors, and explain their functional significance

PSMABCH102

Advanced Instrumentation and Analytical Techniques-I

At the end of the course, a Learner should be able to:

- CO1:** Describe a colligative property and explain the difference between the effects of nonelectrolytes and electrolytes on colligative properties.
- CO2:** Describe the surface tension phenomenon and viscosity and its applications
- CO3:** The difference between strong and weak acid as well as strong and weak base and applications of acids and bases in daily life
- CO4:** Make a buffer solution and define its properties
- CO5:** Describe the principles and applications of the different types of microscopy
- CO6:** Know the principles of utilizing radioactivity applied to biochemistry and related fields where radioactivity is an integral part.
- CO7:** Explain use of spectroscopic methods for qualitative and quantitative analysis with special emphasis on UV/Vis spectroscopy.
- CO8:** Describe the selection rule for infrared-active transitions.

PSMABCH103

Industrial Biochemistry and Bioinformatics – I

At the end of the course, a Learner should be able to:

- CO1:** Evaluate factors that contribute in enhancement of cell and product formation during fermentation process.
- CO2:** Differentiate the rheological changes during fermentation process
- CO3:** Know the industrial applications of fermentation processes.
- CO4:** Understand technique of plant tissue culture and its application.
- CO5:** Comprehend the fundamental concepts of animal cell culture, and its importance.
- CO6:** Discuss the significance of transgenesis with reference to animal models.
- CO7:** Explain the principles and applications of animal cloning and gene therapy along with ethical concerns.
- CO8:** Explain the mechanisms of spoilage and deterioration of foods and raw materials: microbial, chemical, physical, biochemical, etc.
- CO9:** Explain the basic principles of food preservation processes
- CO10:** Explain the different meanings of the quality concept and its influence.
- CO11:** Describe, distinguish and use the several techniques and quality management tools and the role of government and regulatory bodies in maintain quality.
- CO12:** Have knowledge and awareness of the basic principles and concepts of biology, computer science and mathematics
- CO13:** Use existing software effectively to extract information from large databases and to use this information in computer modeling

PSMABCH104

Research Methodology, Bio-statistics & Soft Skills Development - I

At the end of the course, a Learner should be able to:

- CO1:** Understand a general definition of research design.
- CO2:** Identify the overall process of designing a research study from its inception to its report.
- CO3:** Select from, use and interpret results of, descriptive statistical methods effectively.
- CO4:** Demonstrate an understanding of the central concepts of modern statistical theory and their probabilistic foundation.

- CO5:** Understand the basic principles underlying survey design and estimation.
- CO6:** Methods for designing and selecting a sample from a population.
- CO7:** Gain insight into study of demography and understand the core social demographic variables (e.g., fertility, mortality, morbidity, migration)
- CO8:** Assert strengthened personal character and an enhanced ethical sense
- CO9:** Identify, understand, and apply contemporary theories of leadership to a wide range of situations and interactions
- CO10:** Understand and apply knowledge of human communication and language processes as they occur across various contexts

PSMABCH201

Advanced Bioorganic Chemistry II

Learners will be able to

- CO1:** Understand plant physiology, biochemical pathways and mechanism of light-dark reactions, Calvin cycle, C4 and CAM pathway during photosynthesis.
- CO2:** Correlate biosynthesis of plant products like starch, sucrose, cellulose
- CO3:** Rule out the misconception that photosynthesis only takes place in plants.
- CO4:** Gain knowledge about biosynthesis, storage, secretion of endocrine hormones
- CO5:** Understand the basics of mechanisms of hormone actions and regulations.
- CO6:** Explain the anatomy, physiology and diseases related to bone, muscles, nervous tissues and connective tissues.
- CO7:** Explain the principle, mechanism and applications of bioluminescence, natural bioactive compounds and unusual biomolecules.

PSMABCH202

Advanced Instrumentation and Analytical techniques II

Learners will be able to

- CO1:** Describe the methods used in the analysis of compounds.
- CO2:** Demonstrate the operation of centrifugation and chromatography
- CO3:** Explain the chemistry behind the methods of analysis of compounds
- CO4:** Identify which method is more effective for analysis of compounds.
- CO5:** Apply the principle of electrophoresis.
- CO6:** To understand the fundamentals of special instruments and their applications.

PSMABCH203

Industrial Biochemistry and Bioinformatics – II

Learners will be able to

- CO1:** Understand the industrial importance and biosynthesis/manufacturing of carbohydrates, lipids, proteins, enzymes, vitamins and hormones
- CO2:** Apply the knowledge of immobilization techniques in research.
- CO3:** Discuss the applications of biomolecules in medicines and other industry.
- CO4:** Gain the knowledge about environmental sustainability and monitoring systems.
- CO5:** Clear the concepts of quality assurance and quality control.
- CO6:** Have knowledge and awareness of emerging trends in environmental sciences, Nano biotechnology, biological sciences
- CO7:** Have an understanding of bioinformatics
- CO8:** Apply the fundamentals of bioinformatics in recent areas of research.

PSMABCH204

Research Methodology, Biostatistics & Soft Skills Development II

Learners will be able to

- CO1:** Interpret the research data
- CO2:** Analyse the research data and write a report.
- CO3:** Prepare a layout of research paper or poster
- CO4:** Able to give oral or poster presentation.
- CO5:** Use Biostatistical tools for analysing and interpreting obtained data.
- CO6:** Test the hypothesis
- CO7:** Apply the knowledge of nonparametric tests, yules coefficients, ANNOVA, Correlation and regression.
- CO8:** Strengthen personal character and enhance ethical sense.
- CO9:** Build the capacity of learn, unlearn and relearn.
- CO10:** Apply the knowledge of group discussion, panel discussion in practice.
- CO11:** Develop the ability to write a resume and interview skills.

PSMABCH301

Advanced genetics-I

A Learner should be able to:

- CO1:** To appreciate classical genetics
- CO2:** Get deep insight into the nature of genetic material
- CO3:** Decipher the Organization of DNA in genome and understand the concept of gene
- CO4:** Comprehend the cell cycle and its regulation
- CO5:** To gain insight into the process of replication and its mechanism
- CO6:** Understand and appreciate the process of RNA formation through transcription.
- CO7:** Understand and appreciate the process of protein synthesis through translation.

PSMABCH302-

Advanced Immunology- I

A Learner should be able to:

- CO1:** Compare and contrast the concepts of innate and acquired immunity.
- CO2:** Understand the morphology and functions of various immune cells
- CO3:** Gain knowledge about immunoglobulin structures & functions and to appreciate the diversity generated for antibodies
- CO4:** Comprehend the use of antigen-antibody reactions in diagnostics
- CO5:** Gain insight into immunological function of Complement and MHC molecules

PSMABCH303- Advanced Metabolism-I

A Learner should be able to:

- CO1:** Understanding of metabolic pathways (catabolism as well as anabolism) of carbohydrates, proteins, lipids as well as nucleoproteins, their diversity and how these are specifically regulated and interrelated in different cells
- CO2:** Contemplate the crucial role of some hormones with regard to the integration of metabolic pathways.
- CO3:** Analyse conditions of malfunction of the metabolic pathway and its interpretation on health
- CO4:** Apply the knowledge of metabolic pathways to clinical research.

PSMABCH304- Clinical and Pharmaceutical Biochemistry, Human Nutrition and Dietetics- I

A Learner should be able to:

- CO1:** To understand the composition and functions of body Fluids in health and disease

- CO2:** To appreciate the complex cycle of blood coagulation and the requirement of multiple factors.
- CO3:** To gain insight into blood chemistry
- CO4:** To understand the basics of pharmacokinetics and its factors.
- CO5:** To be exposed to concept of clinical research
- CO6:** To gain insight into the technicalities of clinical trials and understand the ethical issues
- CO7:** To comprehend the Nutritional significance of Macronutrients
- CO8:** To understand nutrient-gene and drug-nutrient interactions
- CO9:** To comprehend the issues with eating disorders and its solution
- CO10:** To appreciate laws and regulations with respect to nutrition
- CO11:** To widen the understanding into nutraceuticals and sports nutrition

PSMABCH401

Advanced genetics-II

A Learner should be able to:

- CO1:** To gain insight into regulation of gene expression of prokaryotes as well as eukaryotes in the process of central dogma
- CO2:** To appreciate use of Medical genetics in Genetic screening, Genetic diagnosis, Genetic counselling and other clinical applications.
- CO3:** To understand the types for mutations
- CO4:** To understand chromosomal abnormalities
- CO5:** To gain insight into techniques in nucleic acid analysis
- CO6:** Understand and appreciate Recombinant DNA Technology (RDT)
- CO7:** Understand and appreciate the technicalities of Human Genome Project and the diverse array open for research

PSMABCH402-

Advanced Immunology- II

A Learner should be able to:

- CO1:** To understand the immunological role of cytokines and their application in clinics
- CO2:** Understand the different immune responses
- CO3:** Gain knowledge about hypersensitivity
- CO4:** Comprehend Immune Response to infectious diseases caused by bacteria, viruses, fungal, protozoa and Helminths
- CO5:** Gain insight into immunological response in transplantation
- CO6:** Understand immunological tolerance
- CO7:** To understand autoimmunity and etiology of autoimmune diseases
- CO8:** To gain insight into tumour immunology
- CO9:** To comprehend immunodeficiencies, the immunological basis and management

PSMABCH403

Advanced Metabolism-II

A Learner should be able to:

- CO1:** To understand the physiological significance of water and Electrolyte Balance in the organism
- CO2:** Understand the disorders associated with imbalance in water and electrolyte balance
- CO3:** To appreciate the metabolism, metabolic functions and clinical condition related to macro and micro nutrient minerals and related disorders of the same

- CO4:** To understand metabolism, metabolic functions and clinical condition related to fat soluble as well as water soluble
- CO5:** To appreciate the Vitamins- Mineral Interaction for proper physiological functioning
- CO6:** Apprehend Hemoglobin Metabolism and the abnormal haemoglobins
- CO7:** To gain insight into Hemoglobinopathies, and Disorders of Heme synthesis and degradation
- CO8:** To appreciate the significance of acid base balance and the consequences of its disbalance
- CO9:** To gain indepth knowledge of cancer, its causes, its pathophysiology and genetics
- CO10:** To understand the molecular basis of cancer cell behaviour
- CO11:** To understand the principle of stem cell research and its various types
- CO12:** To appreciate the applications and ethical issues with Stem Cell Research:
- CO13:** To understand the theories of aging and its pathophysiology

PSMABCH404

Clinical and Pharmaceutical Biochemistry, Human Nutrition and Dietetics- II

A Learner should be able to:

- CO1:** To appreciate the study of pharmacodynamics and pharmacokinetics
- CO2:** Understand the molecular basis of drug action & pharmacological selectivity with special reference to structure-function Relationship
- CO3:** To gain insight into New Drug Investigation and Application
- CO4:** To understand and be able to provide dietary planning and management in various conditions of health and disease
- CO5:** To be able to utilise the various techniques for assessment of nutritive status
- CO6:** To familiarize with the working of National and International Agencies in combating malnutrition

B.Sc.- BIOTECHNOLOGY

Program outcomes (PO):

- PO1:** Concepts and knowledge strength in genetic engineering biochemistry, immunology, microbiology, molecular biology, tissue culture of plant and animal cells along with core subjects such as chemistry, biophysics, mathematical biology enable them to applied in different areas of biotechnology including biomedicine, agriculture an industrial production.
- PO2:** Student will be equipped with good professional and practical skills in biotechnology, soft skills in communication.
- PO3:** The graduate can work as expert, technician, researcher as well as pursue teaching job OR higher education in India or abroad, competent enough to face challenges academically and professionally at national and international level.

Program specific outcomes :

It enables a student to

- PSO1:** Adept with knowledge and proficiency in basic laboratory skills common to clinical and non-clinical research laboratories viz., aseptic techniques, make accurate and precise measurements using balances for the preparation of solutions, reagents, media; macro- and micro-pipetting, use a microscope, operate state of art equipment and instruments, and maintaining a proper scientific laboratory notebook.
- PSO2:** Equipped with knowledge to explain and properly apply scientific methods while working on a research project, develop valid hypotheses, design experiments, gather analyse and interpret data using current technology,
- PSO3:** Capable to prepare written and oral scientific Communications
- PSO4:** Exhibit growth in academic performance and personal and professional responsibility.

Semester I

USBT 101

Basic Biotechnology I

The student will be imparted with

- CO1:** knowledge of biotechnology,
CO2: branches and its use in areas like agriculture, health care,
CO3: environmental protection
CO4: scope of the subject was envisaged

USBT 102

Basic Biotechnology II

Student is acquainted with

- CO1:** the concept of chromosomes,
CO2: genes and alleles with inheritance of traits.
CO3: knowledge of DNA structures, chromosomes and ploidy
CO4: gene interactions and syndromes

USBT 103

Basic Life Sciences I

Student is acquainted with

- CO1:** Concept and knowledge of microbial, plant and animal biodiversity
CO2: Develops skill in identifying bacteria, fungi, plant and animal groups

USBT 104

Basic Life Sciences II

Student should-

CO1: Gains knowledge of cell structures

CO2: Learn different staining techniques

CO3: Develops microscopic skills

CO4: Acquaints with the ultra structure of cell and cellular organelles

USBT 105

Basic Chemistry I

Student

CO1: Acquires hands-on skills in preparation of Buffers and Solutions,

CO2: understands the instrumentation associated with chemical analyses

CO3: understands the basic concepts of sciences like chemical bonds,

CO4: knows the electrochemistry which can be used for developing sensors,

CO5: knows the principles of electrochemistry in separation of metallic and biomolecules

CO6: applications of chemistry well discussed with reference to biotechnology

USBT 106

Bioorganic Chemistry I

Student

CO1: acquires knowledge of various Biomolecules ,

CO2: understands the basics of Classification,

CO3: can explain Structure and its differences

CO4: capable to Characterize carbohydrates, lipids and nucleic acids

USBT 107

Quantitative and analytical tools in biology

Student

CO1: Develops ability to analyse the scientific information by manual methods

CO2: can use computer based methods for analysis of data

CO3: can operate the Windows operating system ; Word™ word processing, Microsoft Power Point ,

CO4: can communicate using computer systems viz., send and receive e-mail using Outlook, attach and retrieve attached files via email,

CO5: can perform web surfing, uses Web browser, retrieve files via a web page and

CO6: stands unique and gets better job opportunities in future due to good communications skills and knowledge

SEMESTER II

USBT 201

Biotechnology-1

Student is

CO1: acquainted with food biotechnology,

CO2: role of biotechnology food processing and quality control explained

CO3: knowledge imparted on the use of microorganisms in food biotechnology,

CO4: role of preparation, preservation and spoilage food materials and the role of microorganisms understood.

CO5: Industrial biotechnology broadens the horizons of a student to know the processes, fermenters.

CO6: Biotechnology based industries, culture of animal tissue cultures on large scale, fermentation, secondary metabolites, medicines and SCP knowledge empowers the candidate with new ideas

USBT 202

Biotechnology-2

Knowledge imparted to the student includes

- CO1:** of models of DNA replication,
- CO2:** genetic transfer mechanisms in bacteria
- CO3:** chromosome aberrations and point mutations.

USBT 203

Life Sciences I

Student

- CO1:** acquaints with concept of microbial ecosystems,
- CO2:** Understands the plant physiology and the importance
- CO3:** Compares the physiology of different animals depending their classification which sharpens the knowledge processes with reference to biotechnology
- CO4:** The knowledge of various microbial interactions and physiological processes in plants and animals enables to visualize the need to protect the organisms and the environment.

USBT 204

Life Sciences II

Student understands

- CO1:** the role of cell cycle, growth, nutrition and sterilization
- CO2:** knowledge of growth, enumeration and control of microorganisms imparted

USBT 205

Chemistry – Physical Chemistry

Student:

- CO1:** Capable of Titrimetric and Volumetric Estimations necessary in analysis and research in biotechnology
- CO2:** Well trained to handle of basic Analytical Techniques like Chromatography and Colorimetry and apply for his creative analytical studies

USBT 206

Bioorganic Chemistry

Student

- CO1:** knowledge of Classification, Structure and Characterization of proteins makes a student to understand the value of specific biomolecule
- CO2:** the composition of amino acids and their characteristic features impact on the protein activity is explained
- CO3:** Knows the importance of, vitamins and enzymes in biotechnology

USBT207

Societal Awareness and Environmental Management

Student

- CO1:** Develops an ability to understand the environment and a awareness to protect environment and society,

CO2: biotechnology student will try to contribute to save the earth in future
CO3: well acquainted with environment, pollution, and methods to abate and laws.

SEMESTER III

USMABT301

FUNDAMENTALS OF IMMUNOLOGY

At the end of the course the student will gain knowledge of:

- CO1:** The concepts of nonspecific and specific immunity.
- CO2:** The cells and organs involved in immunologic response
- CO3:** Function, and characteristics of antigens and antibodies

USMABT302

BIOPROCESS TECHNOLOGY

By the end of the course the student will be able to:

- CO1:** Develop an understanding of the various aspects of Bioprocess Technology.
- CO2:** Develop skills associated with screening of Industrially Important Strains.
- CO3:** Understand principles underlying design of Fermenter, Fermentation Process and downstream processing.

USMABT 303

GENETICS

By the end of the course the student will:

- CO1:** Know the genetic basis of sex determination in different organisms
- CO2:** Get the knowledge of sex linkage and other related inheritances
- CO3:** Learn the cytoplasmic inheritance of characters with maternal effects
- CO4:** Know the molecular mechanisms of genetic recombination and gene mapping.

USMABT304

MOLECULAR BIOLOGY

The student will be able to:

- CO1:** discuss the mechanisms associated with gene expression at the level of transcription and translation.
- CO2:** Understand how genetic information is stored in DNA and RNA, and information is decoded by the cell
- CO3:** discuss the mechanisms associated with regulation of gene expression in prokaryotes
- CO4:** and understand how the flow of information is controlled in response to the changes in environment by the operon models

USMABT305

APPLIED CHEMISTRY-1

By the end of the course the students:

- CO1:** knowledge in reactive intermediates, carbonyl chemistry, and coordination compounds is updated.
- CO2:** can apply the theoretical knowledge in better understanding the biological aspects and apply in their future

USMABT306

BIOPHYSICS

By the end of the course the student will:

- CO1:** Develop an understanding of the different aspects of classical physics.
CO2: Be able to relate principles of physics to applications and techniques in the field of biology such as microscopy, spectroscopy and fluid dynamics

USBT307

BIOSTATISTICS AND MATHEMATICAL BIOLOGY

By the end of the course the student will be able to:

- CO1:** gain an understanding of the basic concepts of mathematics and Biostatistics.
CO2: apply the various statistical tools for analysis of biological data.

USMABT401

FUNDAMENTALS OF MEDICAL BIOTECHNOLOGY

By the end of the course the student will be able to:

- CO1:** list the factors playing a role in causing a disease gain.
CO2: discuss the various aspects of human systemic infections including causative agents, symptoms and prophylaxis.

USMABT402

FERMENTATION TECHNOLOGY

By the end of the course the student will be able to:

- CO1:** Get acquainted with the industrial aspect of the field of Microbiology, and also learn about growth pattern of microbes in different industrial systems.
CO2: Acquire experimental knowledge of microbial production of various industrial products such as alcohol, etc.
CO3: Develop an understanding of process control, upstream and downstream process.

USMABT 403

FUNDAMENTALS OF RECOMBINANT DNA TECHNOLOGY

By the end of the course the student will:

- CO1:** Know the use of various types of cloning vectors and their applications in recombinant DNA technology
CO2: Get the knowledge of enzymes used in gene cloning with their mode of action and applications
CO3: Learn the technique of electrophoresis for nucleic acids and proteins, types and applications.

USMABT404

CYTOLOGY

Enables the students to know

- CO1:** Different membrane systems, artificial membranes and their importance, biomimicking and its prominent role in trafficking of molecules and drugs. analyses the role of Communication systems amongst cells
CO2: Membrane systems are important for cell and take a prominent role in trafficking of molecules and drugs.
CO3: Communication systems amongst cells determine inter and intracellular metabolic activity and decide the fate of the cell

USMABT405

METABOLISM

By the end of the course the student will be able to

- CO1:** discuss the metabolic pathways of carbohydrates, amino acids, lipids and nucleotides.
CO2: Gain awareness of various clinical disorders within the context of each topics

USMABT406

Applied Chemistry

By the end of the course the student will be able to

- CO1:** Sample preparation using different techniques and assess using the spectroscopy techniques
CO2: understand the basics of nanno, green and polymer chemistry principles and assess their applications in Biotechnology

USMABT407

BASICS OF BIOCOMPUTING AND BIOINFORMATICS

By the end of the course the student will be able to:

- CO1:** gain an understanding of the basic concepts of Biocomputing and Bioinformatics .
CO2: understand the tools used in bioinformatics.

SEMESTER V

USBT501

Cell Biology and Medical Biotechnology

At the end of the course the student will be able to:

- CO1:** Understand the basic principles of signal transduction mechanisms, in particular the concepts of cell signalling messengers and cell communication.
CO2: Learn the essential concepts of virology which include the structure of different viruses, properties, replication and types of infection
CO3: Describe the clinical application and mode of action of chemotherapeutic drugs employed in the treatment of infectious diseases

USBT 502

Biochemistry, Immunology and Instrumentation

At the end of the course the student will be able to:

- CO1:** Demonstrate an understanding of the carbohydrate metabolic pathways, its regulation and clinical significance
CO2: To explain the roles of the endocrine system and apply endocrinological principles to determine the basis and consequences of specific endocrine disorders
CO3: To gain an understanding of the functions of cytokines, cytokine receptors, hypersensitive reactions and recognize its clinical manifestations
CO4: Apply the fundamental knowledge acquired for specific competencies related to the use of spectroscopic techniques

USBT 503

Genetics, Molecular Biology and r-DNA Technology

By the end of the course the student will:

- CO1:** know the method of gene mapping, methods to approach different types of gene mapping.
CO2: Recombinant DNA technology and its applications will give wide are of understanding and application in future research.

USBT 504

Industrial Biotechnology

At the end of the course the student will be able to:

- CO1:** Gain an in-depth understanding of the manufacturing principles and practices associated with dairy food products
- CO2:** fermentation processes
- CO3:** Develop an understanding of the process control, upstream and downstream processing stages in an industry

USBT505

Advances in Biotechnology

By the end of the course the student will understand the

- CO1:** overview of marine environment and its living and nonliving resources in support of marine biotechnology the future alternative.
- CO2:** develop an understanding of the significance Plant biotechnology and its techniques to introduce different breeds
- CO3:** relevance of plant breeding techniques to develop better varieties and identification. Marine environment as a new area worth for future research

USBT601

Medical Biotechnology

Student should have

- CO1:** general knowledge of what a drug is, how drugs can be administered, what drugs do to the body, what the body does to drugs, and how drugs are metabolised and eliminated.
- CO2:** have a clear understanding of Receptor Theory , Drug Metabolism

USBT602

Biochemistry and Instrumentation

By the end of the course the student will understanding

- CO1:** The biochemical and nutritional role of vitamins and minerals and the disorders associated with their deficiency
- CO2:** The functions of group I hormones, their mechanisms of action and the disorders associated with abnormal endocrine functions of, thyroid, adrenal and gonadal hormones.
- CO3:** Overview of the biochemical events in lipid biosynthesis and its regulation.
- CO4:** Principle working and applications of chromatographic techniques and use of radioisotopes in analysis of biomolecules

USBT603

Molecular biology and Tissue culture Techniques

By the end of the course the student will be familiar with:

- CO1:** Development of transgenic organisms and applications,
- CO2:** Plant stress management,
- CO3:** Applications of Biotechnology in various industries

USBT604

Environmental Biotechnology

- CO1:** The principles of microbial ecology, the importance of microbial diversity in

environmental systems, interaction of microbial population with the environment, and the method used to study the microbial ecology for practical applications in environmental biotechnology

CO2: The nature of bio-aerosols, method of analysis, control measures employed and their significance in biosafety for industrial and laboratory practices.

CO3: The dynamics of soil biota, the importance of different microbial populations, as well as the importance of molecular approaches in soil biotechnology and their potential applications in agri-biotechnology

CO4: The modern trends in environmental biotechnology, such as treatment and disposal of effluents and will be able to describe existing and emerging technologies that are important in the area of environmental biotechnology

USBT605

Advances in Biotechnology-II

By the end of the course the student will be acquainted with:

CO1: The emerging field of nano-biotechnology, their applications in biological sciences.

CO2: The understanding about the management of quality practices in healthcare and food industry

CO3: The significance of biosafety, and biological risk assessment. The approaches employed for assessing food quality and food safety.

CO4: Basics of intellectual property and ethical issues related to GMOs

MSC BIOTECHNOLOGY

PROGRAM OUTCOMES:

Biotechnology is the future of current generations due to its characteristic charismatic amalgam of science, commerce and informatics components. Technological changes in biotechnological field and its closely related disciplines promote education, research and outreach activities. The program at the post graduation level will enhance the students' ability to

- PO1:** demonstrate their knowledge of biotechnology concepts, technical skills to support biotechnology research activity.
- PO2:** understand of industrial regulations and the regulatory environment in the biotechnology industry.
- PO3:** apply research strategies to solve environmental, industrial, pharmaceutical biotechnology problems.
- PO4:** communicate effectively to address conceptual clarifications, industrial applications, startup technologies and appropriate audiences of biotechnology field.
- PO5:** Enhances the understanding of management tools and concept as they organize education oriented futuristic management programmes in the form of fests which sharpen their individual and team work abilities.
- PO6:** Compete the world with a capacity to work or participate in the institutions specialized in pharmacy, agriculture, forestry, aquaculture, food industry and microbial products used for environmental issues.

PROGRAM SPECIFIC OUTCOMES :

Empowers the student

- PSO1:** To face the competitive world of jobs, startups and entrepreneurial demands
- PSO2:** To apply the knowledge acquired in the fields of genetic engineering molecular biology and tissue culture, with reference to concepts, methodologies, and techniques for the recent and relevant scientific research and applications in diverse fields of healthcare and agriculture.
- PSO3:** To demonstrate their technical knowledge in preparing samples for various analyses,
- PSO4:** To exhibit an ability to work independently and collaboratively in the area of interest and to develop programs for the benefit of community in relation to environmental, ethical, health issues.
- PSO5:** To exhibit growth in academic and professional performances and perform personal and professional responsibility to the core.
- PSO6:** To prepare written and oral scientific communications, and identify and solve the scientific problems and report
- PSO7:** To design a scientific study, perform, and analyze using basic molecular biology methodologies and recombinant DNA techniques, including agarose and polyacrylamide gel electrophoresis, restriction enzyme digestion, bacterial transformations, plasmid DNA protein expression, PCR, and tissue culture and use statistical analyses, tables and graphs to report results, that describe detailed experimental procedures, and that clearly explain conclusions.
- PSO8:** To follow professional ethics, national and international laws, to protect intellectual properties and entrepreneurial debut at national and international arena.

SEMESTER I

PSMABT101

IMMUNOLOGY

At the end of the course the student will be able to:

- CO1:** Gain an advanced knowledge of the underlying principles of immune responses and disorders of the immune system
- CO2:** Understand the methods of Manipulating Immunity for Therapeutic purposes

PSMABT102

GENOMES TO PROTEOMES

By the end of the course the student will be able to:

- CO1:** Understand the diverse physical and genetic features of genome anatomies from prokaryotic to eukaryotic genomes
- CO2:** Discuss the mechanisms associated with expression of genome and transcriptome
- CO3:** Understand how genetic information is stored in genome, how that information is decoded by the cell to form the transcriptome and the proteome
- CO4:** discuss the mechanisms associated with regulation of gene expression in eukaryotes
- CO5:** and understand how the flow of information is controlled in response to the changes in genome activity

PSMABT103

MOLECULAR CELL BIOLOGY

Enables the students to

- CO1:** know different membrane systems , artificial membranes and their importance,
- CO2:** understand biomimicking and its prominent role in trafficking of molecules and drugs.
- CO3:** analyse the role of Communication systems amongst cells

PSMABT 104

ADVANCED ANALYTICAL TECHNIQUES

By the end of the course the student will:

- CO1:** Know the principle, working and applications of different types of electron microscopes
- CO2:** Know the basics of crystals and symmetries with applications of X – ray crystallography
- CO3:** Learn the principles and applications of various advanced spectroscopic techniques with their use in biological studies; advanced techniques based on light and electromagnetic emission
- CO4:** Study the techniques of molecular modeling and DNA sequencing

PSMABT201

ADVANCES IN IMMUNOLOGY

At the end of the course the student will be able to:

- CO1:** Gain an understanding of various immune response mechanisms in immunity and their therapeutic implications
- CO2:** Translate understanding of basic immune mechanisms into identification of biological, clinical and therapeutic implications

PSMABT202

PHYSIOLOGICAL BIOCHEMISTRY

By the end of the course the student will be able to :

- CO1:** Understand the physiological and clinical significance of certain biomolecules
- CO2:** Comprehend the significance of biological acid base buffer system

CO3: Gain an insight in selective inborn errors of metabolism.

CO4: Learn about defective enzymes in metabolism, clinical symptoms, diagnosis, and treatment of metabolic disorders of amino acids, carbohydrates, lipids, purines and pyrimidines.

PSMABT 203

INDUSTRIAL BIOTECHNOLOGY

By the end of the course the student will be able to:

CO1: This course imparts a comprehension of basic skills necessary for employing biotechnology principles. The knowledge gained in this course would be used to understand and evaluate the different microbial transformation of the current and future biotechnology related products on the market.

CO2: The student will get exposure of immobilization techniques and wide applications of enzymes and their future potential.

CO3: The students will gain an understanding in both scientific knowledge of designing and producing novel biologics, and business challenges in biopharmaceutical companies, including regulatory issues. Apply the knowledge of pharmaceutical manufacturing in the production of biopharmaceuticals like antibiotics, vaccines, proteins and hormones

CO4: Get an understanding to carry out the quality control procedures in the production of various biopharmaceuticals and able to explain the GMP regulatory aspects in the development of pharmaceuticals

PSMABT204

RESEARCH METHODOLOGY AND SCIENTIFIC WRITING

The student will be capable to

CO1: develop research aptitude, logical thinking and reasoning.

CO2: understand basic principles of research methodology and identify a research problem.

CO3: understand a general definition of research design.

CO4: identify the overall process of designing a research study from its inception to its report

CO5: identify the a research problem, make proposal , execute and report.

PSBTP 301

PTC AND ATC

The student will be capable of

CO1: understanding the Cell and tissue culture requirements and the preparation of media and sterilization techniques

CO2: Isolating plant and animal cells and culture in laboratory.

CO3: understand between cell suspension cultures and adherent cultures of animal cells

CO4: animal cells and the development of Immortal cell cultures, characterization of cell lines, preservation techniques and thawing of cell lines

PSBTP302

MEDICAL MICROBIOLOGY

Student will demonstrate

CO1: advanced knowledge and understanding of the nature of pathogenic microorganisms (bacteria)

CO2: the modes of transmission of pathogenic microorganisms and microbial diseases;

CO3: demonstrate knowledge of the laboratory diagnosis of microbial diseases and practical skills,

CO4: the isolation and characterisation of specific microbes in clinical specimens;

PSBTP 303

CLINICAL STUDIES

The students understands

CO1: the need and type of different clinical trials and their importance

CO2: clinical trial research designs and regulatory affairs management

CO3: need of drug development and the phases of drug development

CO4: regulatory authorities in pharma research and their role

CO5: ethical clinical trial programs and assess their functionality

CO6: innovative biopharmaceutical/biotechnology products development through the discovery processes and their progress into the clinical trial phases

PSBTP304

DEVELOPMENTAL BIOLOGY

Student will be enabled to understand

CO1: sperm entry which trigger post-fertilization processes in the egg/activation of oocyte

CO2: Control of extracellular factors on organ and tissue growth

CO3: Role of cell determination and cell specification play in organogenesis and the role of hormones on sex determination

CO4: Ivf methods and biotechnology,

CO5: Embyo testing methods to identify the abnormalities

PSBTP 401 NANOTECHNOLOGY

The student will be capable to

CO1: Understand the concept of Nanoscience

CO2: learn how nanomaterials are synthesized and characterization techniques

CO3: Can assess the impact of nanomaterials and importance in environment ,pharma and impact assessment studies

PSBTP402: GMO AND ENVIRONMENT

The student will be able to empowered with information on

CO1: Need of GMOs with examples of such as humulin, ice minus bacteria

CO2: Knowledge of the GMOs and LMOs - environment risk analysis and management

CO3: Understanding India and the management of GMOs in Indian context

CO4: Importance of Institutions such as IGMORIS

CO5: Role of biotechnology in developing pollution indicators & biosensors,

CO6: Importance of biodegradation of xenobiotics, and pesticides,

CO7: Role of phytoremediation in maintaining the pollution free environment

CO8: Modes of Biodegradation of waste from different industries

CO9: Importance of biological detoxification, Removal of oil spillage & grease deposi

PSBTP 403

BIOINFORMATICS

A student shall be able to apply:

CO1: knowledge and awareness of biological databases and their use

CO2: softwares used to extract information from large databases and to use this information identify the genetic sequence of an organism

CO3: understand the MSA and its application to know the phylogeny

CO4: Biomolecules and their structural and sequential information that enable their binding phenomenon and to understand the metabolic pathways

CO5: core of shared concepts, database queries and data analysis

PSBTP404 : BIOSTATISTICS

Student will be capable to

CO1: Select and use descriptive statistical methods and interpret results effectively.

CO2: Understand the need of regression and correlation to assess the community structure

CO3: Test Hypothesis and parametric and nonparametric methods of analyses and assess their relevance in the Biotechnological research

CO4: Apply ANOVA and other methods and evaluate their importance to assess the communities

CO5: Design and select methods to assess, use, and interpret results of biotechnological research.

B.Sc – Computer Science

Program Specific Outcomes:

- PSO1:** Develop the skill to analyze a composite computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- PSO2:** Enhancement of designing, implementing, and evaluating a problem based solution to meet a given set of problem requirements in the respective domain.
- PSO3:** Enhancement of technical communication in different domain.
- PSO4:** Development of an attitude to take and understand responsibilities and infer judgements in computing based areas using legal and ethical principles.
- PSO5:** Implementation of computer science theory and software knowledge in demand-supply markets.

Semester I

USCSMB101A

Computer Organization and Design

Learners will be able:

- CO1:** To learn about how computer systems work and underlying principles.
- CO2:** To understand the basics of digital electronics needed for computers.
- CO3:** To understand the basics of instruction set architecture for reduced and complex instruction sets.
- CO4:** To understand the basics of processor structure and operation.
- CO5:** To understand how data is transferred between the processor and I/O devices.

USCSMB102A

Programming with Python- I

Learners will be able:

- CO1:** Students should be able to understand the concepts of programming before actually starting to write programs.
- CO2:** To develop logic for Problem Solving.
- CO3:** To make familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc.
- CO4:** To apply the problem solving skills using syntactically simple language.

USCSMB103A

Discrete Mathematics

Learners will be able:

- CO1:** To provide overview of theory of discrete objects, starting with relations and partially ordered sets.
- CO2:** To Study about recurrence relations, generating function and operations on them.
- CO3:** To provide an understanding of graphs and trees, which are widely used in software.
- CO4:** To Provide basic knowledge about models of automata theory and the corresponding formal languages.

USCSMB104A

Database Systems

Learners will be able:

- CO1:** To evaluate business information problem and find the requirements of a problem in terms of data.

- CO2:** To design the database schema with the use of appropriate data types for storage of data in database.
- CO3:** To understand and importance of normalization.
- CO4:** To create, manipulate, query and back up the databases.

USCSMB105A

Algorithms & Programming in C

Learners will be able:

- CO1:** To write, compile and debug programs in C language.
- CO2:** To use different data types in a computer program.
- CO3:** To design programs involving decision structures, loops and functions.
- CO4:** To compare call by value and call by reference.
- CO5:** To understand the dynamics of memory by the use of pointers.
- CO6:** To use different data structures and create/update basic data files.

USCSMB106A

Descriptive Statistics and Introduction to Probability

Learners will be able:

- CO1:** To understand the descriptive statistical concepts.
- CO2:** To understand the study of probability concept required for Computer learners.
- CO3:** To know the importance of data and graphs in statistics.
- CO4:** To study different trends and analysis in statistics.

USCSMB107A

Soft Skills Development

Learners will be able:

- CO1:** To know about various aspects of soft skills and learn ways to develop personality.
- CO2:** To understand the importance and type of communication in personal and professional environment.
- CO3:** To provide insight into much needed technical and non-technical qualities in career planning.
- CO4:** To learn about Leadership, team building, decision making and stress management.

Semester-II

USCSMB201A

Principles of Web Design and Web Technologies – I

Learners will be able:

- CO1:** To design valid, well-formed, scalable, and meaningful pages using emerging technologies.
- CO2:** To understand the various platforms, devices, display resolutions, viewports, and browsers that render websites.
- CO3:** To develop and implement client-side and server-side scripting language programs.
- CO4:** To develop and implement Database Driven Websites.
- CO5:** Design and apply XML to create a markup language for data and document centric applications.

USCSMB202A

Programming with Python- II

Learners will be able:

- CO1:** To understand how to read/write to files using python.
- CO2:** To catch their own errors that happen during execution of programs.
- CO3:** To get an introduction to the concept of pattern matching.
- CO4:** To made familiar with the concepts of GUI controls and designing GUI applications.
- CO5:** To connect to the database to move the data to/from the application.
- CO6:** To understand how to connect to computers, read from URL and send email.

USCSMB203A

Calculus

Learners will be able:

- CO1:** To Understand the Mathematical concepts like limit, continuity, derivative, integration of functions.
- CO2:** To understand real world applications by means of these theories.
- CO3:** To formulate a problem through Mathematical modeling and simulation.

USCSMB204A

Data structure

Learners will be able:

- CO1:** To learn about Data structures, its types and significance in computing.
- CO2:** To explore about Abstract Data types and its implementation.
- CO3:** To program various applications using different data structure in Python.

USCSMB205A

Free and open source software with Linux

Learners will be able:

- CO1:** To understand the Linux, from both a graphical and command line perspective, allowing them to easily use any Linux distribution.
- CO2:** To learn advanced subjects in computer science practically.
- CO3:** To acquire the task of Linux System Administrator using the acquired skill set.

USCSMB206A

Statistical Methods and Testing of Hypothesis

Learners will be able:

- CO1:** To enable learners to know descriptive statistical concepts.
- CO2:** To enable study of probability concept required for Computer learners.
- CO3:** To use hypothesis model in computer science study.

USCSMB207A

Green Technologies

Learners will be able:

- CO1:** To learn about green IT achieved in hardware, software, network communication and data center operations.
- CO2:** To understand the strategies, frameworks.
- CO3:** To study the importance of processes and management of green IT.

Semester-III

USCSMB301A

Theory of Computation

Learners will be able:

- CO1:** To understand Grammar and Languages.
- CO2:** To learn about Automata theory and its application in Language Design.
- CO3:** To learn about Turing Machines and Pushdown Automata.
- CO4:** To understand Linear Bound Automata and its applications.

USCSMB302A

Java Programming

Learners will be able:

- CO1:** Object oriented programming concepts using Java.
- CO2:** To understand the importance of input, its processing and getting suitable output.
- CO3:** To Understand, design, implement and evaluate classes and applets.
- CO4:** To implement AWT package.

USCSMB303A

Operating System

Learners will be able:

- CO1:** To provide a understanding of operating system, its structures and functioning.
- CO2:** To develop and master understanding of algorithms used by operating systems for various purposes.
- CO3:** To study the process of deadlock.
- CO4:** To understand the management of memory and process.

USCSMB304A

Database Management System

Learners will be able:

- CO1:** To understand the concepts of stored procedure and triggers and its use.
- CO2:** To learn PL/SQL for data management.
- CO3:** To understand concepts and implementations of transaction management and crash recovery.

USCSMB305A

Principles of Web Design and Web Technologies – II

Learners will be able:

- CO1:** To design valid, well-formed, scalable, and meaningful pages using emerging technologies.
- CO2:** To understand the various platforms, devices, display resolutions, viewports, and browsers that render websites.
- CO3:** To develop and implement client-side and server-side scripting language programs.
- CO4:** To develop and implement Database Driven Websites.
- CO5:** To design and apply XML to create a markup language for data and document centric applications.

USCSMB306A

Computer Networks

Learners will be able:

- CO1:** To understand fundamental concepts of computer networking.
- CO2:** To be familiar with different routing algorithms in networks.

CO3: To study and understand various industrial requirements and International vendor certifications.

USCSMB307A

Combinatorics and Graph Theory

Learners will be able:

- CO1:** To appreciate beauty of combinatorics and how combinatorial problems naturally arise in many settings.
- CO2:** To understand the combinatorial features in real world situations and Computer Science applications.
- CO3:** To apply combinatorial and graph theoretical concepts to understand Computer Science concepts and apply them to solve problems.

Semester-IV

USCSMB401A

Fundamentals of Algorithms

Learners will be able:

- CO1:** To understand the concepts of algorithms for designing good program.
- CO2:** To be aware about different complexities of similar solutions.
- CO3:** To implement algorithms using Python.

USCSMB402A

Advanced JAVA

Learners will be able:

- CO1:** To understand the concepts related to Java Technology.
- CO2:** To explore and understand use of Java Server Programming.
- CO3:** To study and analyse different JDBC connections and databases.

USCSMB403A

Physical Computing and IoT Programming

Learners will be able:

- CO1:** To enable learners to understand System On Chip Architectures.
- CO2:** To prepare Raspberry Pi with hardware and installation.
- CO3:** To learn physical interfaces and electronics of Raspberry Pi and program.
- CO4:** To learn how to make consumer grade IoT safe and secure with proper use of protocols.

USCSMB404A

Android Developer Fundamentals

- CO1:** To understand the requirements of Mobile programming environment.
- CO2:** To learn about basic methods, tools and techniques for developing Apps.
- CO3:** To explore and practice App development on Android Platform
- CO4:** To develop working prototypes of working systems for various uses in daily lives.

USCSMB405A

Linear Algebra using Python

Learners will be able:

- CO1:** To appreciate the relevance of linear algebra in the field of computer science.

- CO2:** To understand the concepts through program implementation.
- CO3:** To develop a computational thinking while learning linear algebra.

USCSMB406A

.NET Technologies

Learners will be able:

- CO1:** To understand the .NET framework.
- CO2:** To develop a proficiency in the C# programming language.
- CO3:** To develop ASP.NET web applications using C#.
- CO4:** To study and use ADO.NET for data persistence in a web application.

USCSMB407A

Software Engineering

Learners will be able:

- CO1:** To apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment.
- CO2:** To develop an ability to work in one or more significant application domains
- CO3:** To be familiar with fundamentals of software testing.

Semester-V

USCSMB501A

Artificial Intelligence

Learners will be able:

- CO1:** To understand AI and different search algorithms used for solving problems.
- CO2:** To acquire different learning algorithms and models used in machine learning.
- CO3:** To acquire skills for practice of AI techniques in game playing.

USCSMB502A

Software Testing and Quality Assurance

Learners will be able:

- CO1:** To understand various software testing methods and strategies.
- CO2:** To Understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software.
- CO3:** To design SQA activities, SQA strategy, formal technical review report for software quality control and assurance.

USCSMB503A

Information and Network Security

Learners will be able:

- CO1:** To understand the principles and practices of cryptographic techniques.
- CO2:** To understand a variety of generic security threats and vulnerabilities, and identify & analyze particular security problems for a given application.
- CO3:** To understand various protocols for network security to protect against the threats in a network.

USCSMB504A

Optimization Techniques

Learners will be able:

- CO1:** To understand importance of optimization of industrial process management.
- CO2:** To apply basic concepts of mathematics to formulate an optimization problem.

CO3: To analyse and appreciate variety of performance measures for various optimization problems.

USCSMB505A

Web Services

Learners will be able:

CO1: To emphasis on SOAP based web services and associated standards such as WSDL.

CO2: To design SOAP based / RESTful / WCF services Deal with Security and QoS issues of Web Services.

Semester-VI

USCSMB601A

Wireless Sensor Networks and Mobile

Learners will be able:

CO1: To list various applications of wireless sensor networks, describe the concepts, protocols, design, implementation and use of wireless sensor networks.

CO2: To implement and evaluate new ideas for solving wireless sensor network design issues.

CO3: To acquire familiarity of mobile network.

USCSMB602A

Cyber Forensics

Learners will be able:

CO1: To plan and prepare for all stages of an investigation - detection, initial response.

CO2: To investigate various media to collect evidence, report them in a way that would be acceptable in the court of law.

CO3: To understand different policies of cyber information.

USCSMB603A

Information Retrieval

Learners will be able:

CO1: To acquire knowledge of the field of boolean retrieval.

CO2: To understand relationship to search engines with respect to IR.

CO3: To be familiar with information retrieval models used by Google.

USCSMB604A

Deep learning applications

Learners will be able:

CO1: To understand the fundamentals concepts of Artificial Intelligence, Machine Learning and Deep Learning.

CO2: To apply machine learning and deep learning concepts to train pre-trained models for solving current machine learning based problems.

CO3: To find relationship and associations between Artificial Intelligence, Machine Learning and Deep Learning.

USCSMB605A

Ethical Hacking

Learners will be able:

CO1: To identify security vulnerabilities and weaknesses in the target applications.

- CO2:** To test and exploit systems using various tools and understands the impact of hacking in real time machines.
- CO3:** To be professional ethical hacker.

MASTER OF COMPUTER SCIENCE

Program Specific Outcome:

- PSO1:** Demonstrate the ability to undertake independent software projects.
- PSO2:** Work in collaborative manner with others in team, and contributing implementation of software.
- PSO3:** Critically evaluate various technical data sets in information models.
- PSO4:** Demonstrate expertise, advanced familiarity and proficiency in an area of specialized software projects.
- PSO5:** An aptitude to take on innovative research at the cutting edge of computer science and its associated zones.
- PSO6:** Apply ethical ideologies and oblige to professional morals and responsibilities and customs of the software practice.

Semester - I

PSMACS101

Analysis of Algorithms and Research Methodology

Learners will be able:

- CO1:** To apply mathematical foundation and advanced algorithm principles.
- CO2:** To identify, analyze and solve complex algorithms.
- CO3:** To grow understanding of the elementary background of research process.
- CO4:** To develop an understanding of numerous research designs and practices.
- CO5:** To be capable to select and define suitable research problems and parameters.

PSMACS102

Advanced Database Systems

- CO1:** To understand concepts of distributed and parallel databases.
- CO2:** To understand and practice temporal and spatial databases
- CO3:** To be familiar with the concept of object-oriented databases.
- CO4:** To acquire the basic knowledge of active and deductive databases.

PSMACS103

Analyst Application Security

Learners will be able:

- CO1:** To identify factors driving the necessity of application security.
- CO2:** To explore physical points of vulnerabilities.
- CO3:** To understand the need and objective of IT auditing.

PSMACS104

Robotics

Learners will be able:

- CO1:** To understand robot anatomy and basics
- CO2:** To identify parameters required in robotics.
- CO3:** To be familiar with programming languages desirable for robotics.

Semester-II

PSMACS201

Compiler construction and Design

Learners will be able:

- CO1:** To appreciate and design the model of compiler construction.
- CO2:** To identify tokens, define regular expressions and implement scanner generator.
- CO3:** To comprehend the principles and procedures used to perform translation and the vital concepts of translator construction.
- CO4:** To be familiar with the role of semantic analyser and create a syntax-directed definition.

PSMACS202

Business Intelligence

Learners will be able:

- CO1:** To understand the necessity and applications of business intelligence
- CO2:** To be able to apply various modelling concepts on enormous data.
- CO3:** To acquire the knowledge of various processes for construction of data warehouse.
- CO4:** To introduce the concept of data mining.

PSMACS203

Advanced Operating System

Learners will be able:

- CO1:** To acquire knowledge of Linux kernel and shells
- CO2:** To be familiar with Linux process creation, termination and process priorities.
- CO3:** To be aware of Linux memory management and Job signals
- CO4:** To gain understanding of Linux threads, scheduling and priorities

PSMACS204

Distributed and parallel Computing

Learners will be able:

- CO1:** To understand foundations of distributed and parallel computing.
- CO2:** To identify issues and solutions of synchronization.
- CO3:** To acquire the knowledge of fault tolerance and replication.

Semester-III

PSMACS301

Ubiquitous Computing

Learners will be able:

- CO1:** To introduce theoretical and technical aspects of ubiquitous computing
- CO2:** To analyze and examine technologies of smart devices and services.
- CO3:** To recognize tagging, sensing and controlling and context-aware system.

PSMACS302

Social Network Analysis

Learners will be able:

- CO1:** To apply and identify social network concepts.
- CO2:** To understand different measures for similarities.
- CO3:** To acquire the knowledge of two mode networks for social network analysis.

PSMACS303

Cyber Forensics

Learners will be able:

- CO1:** To be aware of fundamentals of cyber forensics.

- CO2:** To be familiar with cyber forensic tools.
- CO3:** To be able to understand different layers of network forensics.
- CO4:** To introduce mobile forensics peculiarities.

PSMACS304

Business Intelligence and Big Data Analytics –II

Learners will be able:

- CO1:** To introduce concept of big data and relevant methods.
- CO2:** To be familiar with Map Reduce algorithm
- CO3:** To be able to discover similar items from data sets and apply locality sensitive hashing.
- CO4:** To be aware of concept of mining streams of data.

Semester-IV

PSMACS401

Simulation and Modeling

Learners will be able:

- CO1:** To understand role of simulation and modeling in computer science
- CO2:** To be familiar with different models of simulation and its applications
- CO3:** To acquire knowledge of virtual and real time models

PSMACS402

Business Intelligence and Big Data Analytics –III

Learners will be able:

- CO1:** To understand important concepts of data mining i.e. clustering and classification.
- CO2:** To get familiar with concept of dimensionality reduction.
- CO3:** To acquire knowledge of working of recommendation system.

M.SC (MATHEMATICS) PROGRAMME

PROGRAM OUTCOMES:

- PO1:** Assess the existing knowledge. Concepts, techniques and methodology appropriate to the post graduate chosen discipline.
- PO2:** Conceive and plan a high-quality research project in the appropriate disciplinary or multidisciplinary context.
- PO3:** Synthesize Complex information appropriate to the discipline.
- PO4:** Apply discipline-based and / or cross-discipline based knowledge to design a problem solving strategy.
- PO5:** Employ expressive power appropriate to the discipline.
- PO6:** Exhibit disciplined work habits as an individuals.

PROGRAM SPECIFIC OUTCOMES:

At the end of the program, the learner-

- PSO1:** See a number of contrasting but complementary points of view in the topics continuous and discrete technique(algebraic and geometric) and approaches (theoretical and applied) to mathematician.
- PSO2:** Will develop mathematical thinking, progressing from a computational understanding of mathematics to a broad understanding encompassing logical reasoning, generalization, abstraction and formal proof.
- PSO3:** Acquire sufficient knowledge and proficiency in the use of appropriate technology to assist in the learning and investigation of mathematics.
- PSO4:** Study of least one of mathematics in depth, drawing on ideas and tools from previous coursework to extend their understanding.

M.Sc (Mathematics)

PROGRAMME OUTCOMES

- PO1:** Assess the existing knowledge. Concepts, techniques and methodology appropriate to the post graduate chosen discipline.
- PO2:** Conceive and plan a high-quality research project in the appropriate disciplinary or multidisciplinary context.
- PO3:** Synthesize Complex information appropriate to the discipline.
- PO4:** Employ expressive power appropriate to the discipline.
- PO5:** Exhibit disciplined work habits as an individuals.

PROGRAMME SPECIFIC OUTCOMES

Learners

- PSO1:** Should see a number of contrasting but complementary points of view in the topics continuous and discrete technique(algebraic and geometric) and approaches (theoretical and applied) to mathematician.
- PSO2:** Will develop mathematical thinking, progressing from a computational understanding of mathematics to a broad understanding encompassing logical reasoning, generalization, abstraction and formal proof.
- PSO3:** Will acquire sufficient knowledge and proficiency in the use of appropriate technology to assist in the learning and investigation of mathematics.
- PSO4:** Will study of least one of mathematics in depth, drawing on ideas and tools from previous coursework to extend their understanding.

PSMAMT 101

Algebra

Learners will

CO1: Learn to find kernel, image and verify rank nullity theorem of Linear transformation.

CO2: Solve complex problems using alternating n-form and Laplace expansion of determinants.

CO3: Be able to use the technique, find characteristic polynomials, Jordan Canonical Forms and Rational canonical forms.

CO4: Learn to find bilinear forms, non-degenerate bilinear form, quadratic form and its applications.

PSMAMT 102

Analysis I

Learners will be able to

CO1. To understand standard Topology of \mathbb{R}^n , operator norm and properties of norms.

CO2. Learn Continuity, Compactness and connectedness.

CO3. Acquire knowledge of Riemann integration in \mathbb{R}^n , Measure set, Lebesgue Theorem.

CO4. To understand computation of total derivative, partial derivative and directional derivatives.

CO5. Inverse function theorem, implicit function theorem.

PSMAMT 103

Complex Analysis

Learners will be able to

CO1: Learn Holomorphic function, Application of Abel's theorem to $\exp z$, $\cos(z)$, $\sin(z)$.

CO2. Understand Contour integration, Cauchy-Coursat theorem, Cauchy's estimates.

CO3. Understand zero of holomorphic function. Identity theorem, Counting Zeros.

CO4. To identify Isolated singularities, removable and irremovable singularities

PSMAMT 105: Set Theory and Logic

Learners will be able to

CO1: Understand Logical inferences, method of proof and examples.

CO2: Acquire knowledge of countable and uncountable sets.

CO3: Learn Zorn's lemma and application of Zorn's lemma.

CO4: CO4. Learn Mobius inversion formula, Boolean Algebra.

SEMESTER II

PSMAMT 201

Algebra II

Learners will be able to

CO1: Understand Cyclic group, dihedral groups and Quotient groups.

CO2: Understand Automorphism of groups and Isomorphic groups,

CO3: Find center of group, centralizer or normaliser of an element of group.

CO4: Commutative ring, polynomial ring and Application of Kronecker's theorem.

CO5: Understand Divisibility in integral domain.

PSMAMT 202

Topology

Learners will be able to

CO1. To understand concept of basic Topology, different spaces and uniform continuity.

PSMAMT 203

Analysis II

Learners will be able

CO1: To learn Outer measure, Measurable function, dominated convergence Lebesgue and Riemann integrals,

CO2: To find integration of non-negative functions

PSMAMT 204

Ordinary Differential Equation

Learners will be able

CO1: To find solution to initial value problem for autonomous and non- autonomous ODE.

CO2: Develop Ability to solve second order linear equation in the form of power series.

CO3: To study Sturm-Liouville theory and apply to find Oscillation properties of solution.

CO4: To solve Boundary value problem using eigenvalues and eigen function.

CO5: Develop the ability to solve complex form of Fourier series

PSMAMT 205

Probability

Learners will be able to

CO1: Limit inferior for a sequence of events.

CO2: Get the knowledge of uniform probability measure, field and σ -field.

CO3: Understand and evaluate limit superior and limit inferior for a sequence of events.

SEMESTER III

PSMAMT 301

Algebra III

Learners will be able

CO1: To understand solvable groups and Nilpotent groups.

CO2: To apply direct and semidirect product such as group of translations, Dihedral groups.

CO3: Develop ability to character and orthogonal relations.

CO4: To make matrix representation of homomorphism between free modules of finite ranks.

CO5: Apply structure theorem for finitely generated Abelian groups and linear operation.

PSMAMT 302

Functional Analysis

Learners will be able

CO1: To understand Baire spaces, Complete metric spaces.

CO2: To find equivalence of complete orthogonal set and maximal basis.

CO3: To get clarity of Banach spaces, Quotient space.

CO4: To know separable spaces, examples of separable spaces introduced

PSMAMT 303

Differential Geometry

Learners will be able

CO1: To understand isometry of \mathbb{R}^n , orthogonal transformation of \mathbb{R}^n .

CO2: To find signed curvature for plane curves, curvature and torsion of curves in \mathbb{R}^n .

- CO3:** To get clarity of tangent space to a surface at a point.
- CO4:** To find Gaussian curvature, mean curvature, Isometries of surfaces

PSMAMT 304

Numerical Analysis

Learners will be able

- CO1:** Able to calculate errors in Numerical computation of numbers.
- CO2:** Able to apply Gauss Elimination, Gauss-Jacobi and Gauss-Seidel methods for solving system of linear equations.
- CO3:** Able to find roots of equations using different methods under different situations.
- CO4:** Able to Apply different numerical methods to evaluate Numerical Integrations

PSMAMT 305

Graph Theory

Learners will be able

- CO1:** To understand basic terminology and concept of different graphs.
- CO2:** To apply Dijkstra's algorithm to find shortest path.
- CO3:** To use DFS and BFS algorithms to get spanning tree.
- CO4:** To understand Eulerian and Hamiltonian graphs and to use Fleury's algorithm to find Eulerian circuit.
- CO5:** To understand and use Matching and Ramsey theory in industrial problems

SEMESTER IV

PSMAMT 401

Field Theory

Learners will be able

- CO1:** To understand Field extension, Algebraic extension.
- CO2:** To find compass construction.
- CO3:** Split field for a set of polynomial, normal extension.
- CO4:** To perform application of cyclotomic field, cyclotomic polynomial, Galois groups.

PSMAMT 402

Fourier Analysis

Learners will be able to

- CO1:** Find Fourier series of a periodic function, Riemann integrable functions.
- CO2:** Relate coefficients of functions and their derivatives.
- CO3:** Understand Dirichlet theorem on pointwise convergence of Fourier series.
- CO4:** Learn Fejer's Kernel, Fejer's theorem for a continuous 2π -periodic function.
- CO5:** Use Application of Fourier series to Isoperimetric inequality in the plane.

PSMAMT 403

Calculus on Manifolds

Learners will be able

- CO1:** To study multilinear algebra.
- CO2:** To understand differential forms.
- CO3:** Understand Submanifolds of \mathbb{R}^n Tangent vector and tangent spaces of submanifolds of \mathbb{R}^n .
- CO4:** To integrate a differentiable k-forms on an oriented k-dimensional submanifold of \mathbb{R}^n using Stokes Theory.

PSMAMT 404

Linear Programming and Optimization

Learners will be able to

- CO1:** Use Linear programming to solve industrial problems.
- CO2:** Use the technique of Tranpotation and Assignment problem.
- CO3:** Unconstrained optimization problem.
- CO4:** Constrained optimization problem.

PSMAMT 405

Project

Learners will be

- CO1:** Encouraged to do research project on the topics learned in programme.
- CO2:** Able to build confidence to apply mathematical technique in industry.

M.A. -ENGLISH PROGRAMME OUTCOMES

The arts programme requires students to take courses in communication in languages, social sciences, behavioural sciences, political and economic sciences.

Taken together, these should lead the students to acquire the following:

Knowledge:

- PO1:** Broader knowledge of social sciences that help understand human and social behavior and the functioning of a society
- PO2:** Understanding of the Western and Indian intellectual traditions in its cultural, scientific, aesthetic, rhetorical, ethical and linguistic aspects.
- PO3:** Knowledge of multicultural and global dimensions of relationships and dialogues between nations and cultures
- PO4:** Understand basic methodologies of social science research

Skills:

- PO1:** Be able to read with comprehension, write with clarity and correctness, participate actively in discussion and contribute ideas to the discussion, articulate clearly with logic and evidence, make moral judgements and ethical decisions, and think logically and critically
- PO2:** Be able to use the published scholarship discreetly, evaluate it critically and integrate it into their own papers, reports and essays
- PO3:** Be able to carry out independent research in a social or behavioural science discipline
- PO4:** Be able to demonstrate mastery over two languages
- PO5:** Be able to relate classroom knowledge to real-life situations

Attitude:

- PO1:** Develop tolerance towards differing opinions, cultures, races, castes, ethnicities and religious ideas without giving up the ability to form and defend their individual values and ideas.
- PO2:** Acquire openness to innovative concepts in interdisciplinary fields of knowledge
- PO3:** Develop curiosity about the world and the ecology that they reside in
- PO4:** Develop a willingness to incorporate novel knowledge into their existing patterns of thoughts, behaviour and attitude

PROGRAM SPECIFIC OUTCOMES:

At the end of the program the learner will be able to

- PSO1:** Demonstrate a clear mastery over the four skills in English language (reading, writing, listening and speaking).
- PSO2:** Have an understanding of the social backgrounds and historical facts that influenced the British literature, American Literature and Indian English Literature through ages
- PSO3:** Display a broad knowledge of the major writers and their works from various parts of the world including translated works
- PSO4:** Have an ability to read, understand and critically evaluate works in different genres of literature
- PSO5:** Be able to articulate clear and lucid opinions and viewpoints about a text and its various aspects
- PSO6:** Show keen ability to translate the conceptual knowledge into practical work in various professions
- PSO7:** Display sensitivity and understanding of various cultures other than the one that is native to the student

- PSO8:** Be able to engage in fruitful and enriching dialogue with other peers, critics and intellectuals in the domain of literature
- PSO9:** Be able to apply the understanding of human nature and social behaviour learnt from the various texts to function in a humane way in the society
- PSO10:** Display sensitivity towards the ecological crisis and contribute towards its solutions through the field of literature
- PSO11:** Should be able to use, evaluate and integrate published scholarship into their own research papers giving due credit
- PSO12:** Be able to carry out independent research in interdisciplinary areas and write highly effective and original research papers

**PAPER I & II: LITERARY THEORY AND CRITICISM
PAMAENG101 and PAMAENG201**

At the end of the course the learner will -

- CO1:** Have knowledge of a wide range of critical methods and literary theories
- CO2:** Be able to use the various critical approaches and advanced literary theories
- CO3:** Have enhanced analytical and critical skills for reading a work of literature
- CO4:** Be able to mobilize various theoretical parameters in the analysis of literary and cultural texts
- CO5:** Be familiar with the trends and cross-disciplinary nature of literary theories
- CO6:** Be well acquainted with conventions of research papers

PAPER III&IV: LINGUISTIC AND STYLISTIC ANALYSIS OF TEXTS

PAMAENG102 and PAMAENG202

At the end of the course the learner will -

- CO1:** Have an understanding the concept of style in literature.
- CO2:** Have the linguistic basis of literary criticism (stylistics as an input to literary criticism).
- CO3:** Be acquainted with the concept of discourse and the principles of discourse analysis.
- CO4:** Be able to use stylistic approach in teaching literature.
- CO5:** Know the impact of stylistic analysis on academic writing.
- CO6:** Have knowledge of some major concepts in narratology.

PAPER V&VI: FICTION

PAMAENG103 and PAMAENG203

The learner will

- CO1:** Be familiar with different genres in fiction and major writers in those genres.
- CO2:** Be Acquainted with different types of fictional narratives.
- CO3:** Have a conceptual framework of the growth of fiction over the period of the last three centuries.
- CO4:** Be aware of the social, cultural and psychological implications of fiction.
- CO5:** Have an understanding that literature is an expression of human values within a historical and social context.

PAPER VII&VIII: DRAMA

PAMAENG104 and PAMAENG204

The learner will

- CO1:** Have knowledge of a wide range of theatrical practices around the world.
- CO2:** Have exposure to various critical theories of drama.
- CO3:** Be able them to understand the elements of drama and theatre.
- CO4:** Have knowledge of the conventions of research papers in drama and will be capable of independent research in the field.
- CO5:** Have an understanding that literature is an expression of human values within a historical and social context.

SEMESTER III

I-A: POETRY FROM CHAUCER TO PRESENT PAMAENG301

The learner will

- CO1:** Be familiar with the major representative poets of every age and movements therein.
- CO2:** Have knowledge of different genres of poetry in the context of sociocultural background of the age.
- CO3:** Be able to critically analyse poetry from any genre and capable of carrying out close reading of the poem.
- CO4:** Be acquainted with the conventions of research and be capable of carrying out independent research in the field.
- CO5:** Have an understanding that literature is an expression of human values within a historical and social context.

II – A: GENDERED PERSPECTIVE ON LITERATURE PAMAENG302

The learner will

- CO1:** Be acquainted with gender studies and its complexities and diversity, especially in the constructs of gender and sexuality.
- CO2:** Be able to interrogate rigid frameworks of gender construction while being sensitive to process of socialisation and naturalization of gender in literature.
- CO3:** Be able to critically evaluate literary texts from a multivalent gender perspective.
- CO4:** Be able to explore the thematic and aesthetic concerns in identifying subversive strategies employed by literary writers.
- CO5:** Be acquainted with the conventions of research and be capable of carrying out independent research in the field.
- CO6:** Have an understanding that literature is an expression of human values within a historical and social context.

PAPER III-B: TWENTIETH CENTURY AMERICAN LITERATURE PAMAENG303

The learner will

- CO1:** Be acquainted with the various genres and literary terms of twentieth century American Literature.
- CO2:** Have knowledge of the themes and styles of modern and postmodern American Literary works.
- CO3:** Be aware of the socio-cultural milieu of twentieth century America through the literary texts.

- CO4:** Have an understanding of multicultural sensibilities through the literary works representing them.
- CO5:** Have cross-cultural perspectives and be capable of discussions on American Literature of multiple ethnicities.
- CO6:** Be acquainted with the conventions of research and be capable of carrying out independent research in the field.
- CO7:** Have an understanding that literature is an expression of human values within a historical and social context.

IV-A: SHAKESPEARE

PAMAENG304

The learner will

- CO1:** Have knowledge of the timeless dimensions of Shakespeare's works.
- CO2:** Have an understanding of the contemporary relevance of Shakespeare with reference to modern versions and films based on his plays.
- CO3:** Have a broader picture of the development of the genres of comedy, tragedy and history plays in the Elizabethan era.
- CO4:** Be acquainted with changing critical responses to Shakespeare's play.
- CO5:** Be acquainted with the conventions of research and be capable of carrying out independent research in the field.
- CO6:** Have an understanding that literature is an expression of human values within a historical and social context.

V-B: INDIAN WRITING IN TRANSLATION

PAMAENG305

The learner will

- CO1:** Have an exhaustive study of Indian literatures in the various Indian languages through English translation.
- CO2:** Be acquainted with major movements, trends and tendencies beside major authors and literary texts in multiple languages in India through English translation.
- CO3:** Be equipped with enough knowledge about literary translations in English from Indian languages and help them understand and overcome the problems and issues of literary translation.
- CO4:** Be familiar with the history of translation in India from the Post-independence to contemporary times and enable them to write research papers in the same with new views and perspectives.

SEMESTER IV

I-C: RESEARCH METHODOLOGY

PAMAENG406

The learner will

- CO1:** Be able to define the concept of 'research' and various characteristics of it.
- CO2:** Be able to enumerate the various stages of research and the steps involved in it.
- CO3:** Be familiar with the procedures involved in research.
- CO4:** Be thoroughly acquainted with conventions of writing research paper including chapterisation and plagiarism check.
- CO5:** Be equipped with the techniques and conventions of documentation in research.

- CO6:** Have knowledge of various approaches for researches in English language and literature.
- CO7:** Be able to apply this knowledge to any research that he/she undertakes.

PAPER II-D: POLITICAL READING OF LITERATURE
PAMAENG407

The learner will

- CO1:** Be able to historicize literature as an institution embedded in cultural politics.
- CO2:** Be able to highlight how literary texts, mediate dominant ideologies of their times.
- CO3:** Be able to examine how literary texts indirectly function as an instrument of power.
- CO4:** Be acquainted with the conventions of research and be capable of carrying out independent research in the field.
- CO5:** Have an understanding that literature is an expression of human values within a historical and social context.

PAPER III- PROJECT BASED COURSE
PAMAENG408

The learner will

- CO1:** Have knowledge of the critical approaches of a specific area of literary research.
- CO2:** Be capable of undertaking long term research projects.
- CO3:** Be acquainted with all the conventions of research and methodologies employed in research.
- CO4:** Be experienced in writing research thesis and following the conventions of MLA style sheet 8.
- CO5:** Have developed research orientation and be capable of independent research.

MA PSYCHOLOGY(INDUSTRIAL-ORGANIZATIONAL)

PROGRAM OUTCOMES (POs):

- PO1:** Sensitization of Learners to the disparities of human circumstance and learning to show respect and compassion for all individuals
- PO2:** Understand the importance of research
- PO3:** Innovation and creative thinking
- PO4:** Effective communication skills
- PO5:** Critical thinking
- PO6:** Understand the importance of Ethical Behaviour in all walks of life.
- PO7:** Life-long Learning

PROGRAM SPECIFIC OUTCOMES (PSOs)

Industrial and Organizational (I/O) Psychology explores the impact of individual, group, and organizational processes on workplace productivity, workplace effectiveness and workplace health.

The Master of Arts program in Industrial-Organizational Psychology at Mithibai College (Autonomous) focuses on developing Learners' in-depth understanding of human behavior in the workplace, research design and analytical skills and an expertise in applying evidence-based I/O practices in the diverse organizational settings.

- PSO1: Knowledge Base in Industrial-Organizational Psychology – Learners of the MA Psychology Program will be able to** describe the key concepts, principles, and overarching themes in **Industrial-Organizational Psychology** Including information related to Job and Task Analysis; Employee Selection and Placement; Performance Appraisal and Performance Management; Training; Work Motivation; Work Groups and Work Teams; Attitudes and Job satisfaction; and Organization Development.
- PSO2: Effective Communication- Learners of the MA Psychology Program will be able to demonstrate** effective writing as well as presentation skill.
- PSO3: Critical Thinking- Learners of the MA Psychology Program will be able to** design, and conduct Industrial-Organizational Psychological research; use various statistical analyses to analyze and interpret data; and engage in innovative thinking and problem solving;
- PSO4: Promote Lifelong Learning: Learners of the MA Psychology Program will be able to** apply principles of industrial-organizational psychology to scholarly and/or professional activities to promote lifelong learning.
- PSO5: Promote Ethical Behaviour: Learners of the MA Psychology Program will be able to understand the importance of Ethical Behaviour in the organizational setting and be able to** apply ethical organizational intervention practices.

SEMESTER I-

PAMAPSY101

PERSONALITY PSYCHOLOGY:

The learner will be able

- CO1:** To explain the Freudian psychoanalytic aspects and psychodynamic perspective of personality including Jung, Adler, Horney, Object-Relations, Erickson, and Sullivan
- CO2:** To explain Murray's conceptualization of personality
- CO3:** To describe Maslow and Rogers' Humanistic perspective of personality

- CO4:** To discuss the Genetics and Evolutionary approach to personality
- CO5:** To explain the Physiological approaches to personality including Neuroimaging & Personality Neuroscience
- CO6:** To understand the Behaviourist & Learning aspects of personality
- CO7:** To explain the relationship between Emotions and Personality & to understand the different approaches to Self
- CO8:** To understand the relationship between personality and performance
- CO9:** To understand the various Trait approaches to personality
- CO10:** To understand the relationship between Personality & Psychopathology
- CO11:** To understand Personality in a cross-cultural perspective
- CO12:** To understand the applications of personality psychology

PAMAPSY102

RESEARCH METHODOLOGY

The learner will be able

- CO1:** To understand the Epistemological positions in psychological research
- CO2:** To understand ethical standards of psychological research
- CO3:** To understand how to propose and report quantitative research
- CO4:** To understand Quantitative research in Psychology
- CO5:** To understand sampling, measurement and different methods of data collection
- CO6:** To get an in-depth understanding of the Experimental and Quasi-Experimental Methods used in Psychology
- CO7:** To understand Qualitative Research in Psychology

PAMAPSY103

STATISTICS FOR PSYCHOLOGY

The learner will be able

- CO1:** To explain fundamental concepts about statistical application to psychology
- CO2:** To understand Probability, Discrete Distributions, Continuous Distributions, Bayes theorem, Normality and tests of normality, Homogeneity of variance and tests for Homogeneity of variance
- CO3:** To describe estimation theory, statistical hypothesis testing and types of error.
- CO4:** To describe properties of estimators, methods of estimation: method of moments, least square, maximum likelihood.
- CO5:** To understand Descriptive statistics: central tendency and variability, power and effect size.
- CO6:** To understand Hypothesis testing applied to means: Single mean, two means (independent and dependent)
- CO7:** To understand One-Way Independent Analysis of Variance (ANOVA), One Way Repeated ANOVA, Two-Way Independent ANOVA and One Way MANOVA
- CO8:** To understand the concept, methods and applications of Correlation
- CO9:** To understand Linear regression (OLS), Multiple Linear regression and Logistic Regression
- CO10:** To understand Nonparametric correlations and tests
- CO11:** To understand Chi square test for goodness of fit and test for independence
- CO12:** To describe the basic concepts of Factor analysis
- CO13:** To understand Methods of Extraction and Methods of Rotation
- CO14:** To understand Confirmatory Factor Analysis
- CO15:** To understand R: syntax, data management, descriptive; graphs; basic and multivariate statistics in R

PAMAPSY104

PSYCHOLOGY OF COGNITION AND EMOTION

The learner will be able

- CO1:** To understand Cognitive Neuroscience, methods of Cognitive Neuroscience and the relationship between Intelligence and Neuroscience
- CO2:** To describe Visual Object Recognition and Face perception
- CO3:** In-depth understanding of Attention Processes, Theories of Attention, Consciousness of Mental Processes and Preconscious Processing
- CO4:** Understanding Neuropsychological basis of Attention and Visual Perception
- CO5:** Understanding Memory, Memory Processes, Metacognition and Language
- CO6:** To understand the relationship between Neuropsychological basis of Memory and language
- CO7:** To understand Problem Solving and Creativity
- CO8:** To understand Thinking, Decision Making and Reasoning
- CO9:** To describe Human Intelligence
- CO10:** To understand the Neuropsychological basis of executive functions
- CO11:** Understanding the Theories of Emotions and the relationship between cognition and emotions
- CO12:** CO12: To understand Emotional Development and Emotional Regulation

PAMAPSYPI

PSYCHOLOGICAL TESTING AND PSYCHOMETRICS PRACTICALS

The learner will be able

- CO1:** To understand the role of measurement in Psychology
- CO2:** To understand measurement theories including Classical Test Theory and Modern Test Theory
- CO3:** To understand the process of test construction
- CO4:** Understanding the ethical issues in psychological testing
- CO5:** Learning how a test is to be administered, scored, interpreted & reported
- CO6:** Learning how a test is to be developed
- CO7:** Learning how to find out and report the item analysis, reliability, validity and norms of the newly developed tool

SEMESTER II:

PAMAPSY201

WORKPLACE COUNSELING

The learner will be able

- CO1:** Understanding the current trends and models of workplace counseling
- CO2:** Understanding the Readiness for Employee Counseling, Counseling & Employees Growth and the Ethical Issues in Workplace Counseling
- CO3:** Understanding Work-Life Balance
- CO4:** To understand the Systemic approaches to organizations
- CO5:** To understand the influence of Organizational culture on workplace counseling
- CO6:** To understand the relevance of Employee assistance programs (EAP), Promotion counseling, Preretirement counseling and Counseling for displaced employees in the industrial setting
- CO7:** To understand the dynamics, types, impact and prevention of sexual harassment in organizations

- CO8:** To understand the nature and causes of workplace conflict
- CO9:** To understand the causes and prevention of Violence at workplace
- CO10:** To understand the Strategies to manage workplace conflict

PAMAPSY202

INTERVENTION SYSTEMS IN PSYCHOLOGY

The learner will be able

- CO1:** To understand intervention systems that emphasize background including Freud, Jung and Adler
- CO2:** To understand intervention systems based on humanistic approach including Rogers and Existentialism
- CO3:** To understand intervention systems based on behavioural approach
- CO4:** To understand intervention systems based on cognitive-behavioural approach- CBT & REBT
- CO5:** To understand the fundamentals of group based intervention systems and the ethics of group leaders' actions
- CO6:** Understanding the different approaches to group based interventions such as Existential, Gestalt, Person-centered and Behaviour Therapy
- CO7:** Understanding the eclectic and integrative approach to intervention
- CO8:** To understand the practice & competencies of multicultural interventions
- CO9:** To understand the Psychoanalytic, Person-centered and CBT approach from multicultural perspective
- CO10:** To understand the Post-modern approaches to Interventions including Solution-focused brief therapy, Transactional Analysis, Narrative Therapy, Reality Therapy and Coaching & Mentoring

PAMAPSY203

MULTICULTURALISM: THEORY AND PRACTICE

The learner will be able

- CO1:** To understand Culture, cultural identity development and major cultural variables in the Indian context
- CO2:** To understand Cultural transition and Acculturation
- CO3:** Understanding prejudice; discrimination; and Equity and social justice.
- CO4:** To have cross cultural sensitivity
- CO5:** To understand the ethical issues in multicultural assessment
- CO6:** Writing psychological and educational reports for culturally and linguistically diverse client.
- CO7:** To develop multicultural competencies and culturally appropriate workplace environments.
- CO8:** Managing diversity and conflicts in organizations.

PAMAPSY204

POSITIVE PSYCHOLOGY

The learner will be able

- CO1:** To understand the Assumptions, Goals and Definitions of Positive Psychology
- CO2:** To understand the history and the three pillars of positive psychology
- CO3:** To understand the model of well-being
- CO4:** To describe subjective well-being and positive emotions
- CO5:** Understanding Optimism and Hope
- CO6:** To understand Positive Individual Traits such as love & self-compassion

- CO7:** Understanding Creativity & Wisdom
- CO8:** To understand courage, resiliency, empathy and altruism
- CO9:** To understand Positive Institutions such as positive schooling, health and wellness, aging well and role of family
- CO10:** To understand the Psychology of forgiveness for healthy society
- CO11:** To understand the Me/We balance

PAMAPSY2

PRACTICUM IN INDUSTRIAL PSYCHOLOGY

The learner will be able

- CO1:** To understand applications of psychometric tools and inventories in organizations
- CO2:** To understand selection, administration, scoring, and interpretation of different tools of behavioral and organizational interventions
- CO3:** To develop the skills to analyze behavioral issues in organizations
- CO4:** To understand the functioning of organizations through organized field visits.
- CO5:** Conducting force field analysis and appreciative inquiry
- CO6:** Preparing for and conducting a focused group discussion

SEMESTER III-

PAMAPSY301

PERFORMANCE MANAGEMENT AND COMPETENCY BASED ASSESSMENT IN ORGANIZATION

The learner will be able

- CO1:** To understand the concept, principles and contributions of performance management
- CO2:** To understand the ethical considerations and legal issues in performance management
- CO3:** To understand the models and process of performance management
- CO4:** To understand the concepts, objectives and factors affecting performance appraisal
- CO5:** To understand the benefits and problems of performance appraisal
- CO6:** To understand the various performance appraisal methods
- CO7:** To understand the concept of competency at work, need and types of competency framework and contemporary approaches to assessment
- CO8:** To understand the steps involved in developing an organization wide competency model
- CO9:** To understand Assessment Center and Competency management methods
- CO10:** To understand Competency based HR Planning; Employee Recruitment and Selection; Competency based Employee Training; & Performance Management and Succession Planning
- CO11:** To understand Competency based Development and Career Pathing; and Competency based Compensation

PAMAPSY302

ORGANIZATIONAL BEHAVIOUR (OB)

The learner will be able

- CO1:** To understand the scope and importance of organizational behavior and organizational processes

- CO2:** To understand the challenges and opportunities for organizational behavior
- CO3:** To understand the foundations of individual behavior
- CO4:** To understand the importance of management and the various management functions.
- CO5:** To understand the impact of various attitudes, emotions, and moods in organization
- CO6:** To understand the influence of personality, perception and motivation of individuals in organization
- CO7:** To understand the foundations of group behavior in organizations
- CO8:** To understand the importance of effective communication and leadership in an organizational setting
- CO9:** To understand the operation of power and politics in an organizational setting
- CO10:** To understand the dynamics of conflict and negotiations in an organizational setting
- CO11:** To understand the importance of positive organizational behavior including optimism and hope, resiliency, mindfulness and gratitude in the workplace

PAMAPSY303

ORGANIZATION DEVELOPMENT (OD)

The learner will be able

- CO1:** To understand the Nature and History of Organization Development
- CO2:** To understand the Approaches, Values, Assumptions and Beliefs in Organization Development
- CO3:** To understand the Competencies of an Effective Organization Development Practitioner
- CO4:** To understand the Models and Theories of Planned Change in Organization Development
- CO5:** To understand the Process and Interventions in Organization Development
- CO6:** To understand the meaning and importance of Building Learning Organization
- CO7:** To understand the Organization Development Interventions such as Team Interventions, Intergroup and Third Party Peacemaking Interventions, Structural Interventions and Comprehensive OD Intervention

PAMAPSY304

HUMAN RESOURCE MANAGEMENT (HRM)

The learner will be able

- CO1:** To understand the concept and functions of HRM and the various competitive challenges influencing HR
- CO2:** To understand the concept of equal opportunity and types of discrimination
- CO3:** To understand how to meet the competitive challenges via HRM practices
- CO4:** To understand the process of job analysis and job design
- CO5:** To understand the recruitment and selection process
- CO6:** To explain the process of designing and evaluating the training programs
- CO7:** To understand the Performance management system, approaches to measuring performance, feedback and performance counseling
- CO8:** To understand the purpose and importance of organizational safety and health
- CO9:** To understand the hazards to occupational safety and health; and causes & prevention of occupational accidents

- CO10:** To understand the Occupational Safety and Health Administration (OSHA), violence at workplace, Employee Assistance Programme (EAP), health promotion and wellness program
- CO11:** To understand the legal and ethical issues in HRM
- CO12:** To understand the role of trade unions and collective bargaining in HRM
- CO13:** To understand the grievance redressal procedure in industrial relations
- CO14:** To understand the various Laws affecting labor relations

PAMAPSY3

PROJECT BASED COURSE

The learner will be able

- CO1:** To develop Learners' interest in research
- CO2:** To develop the skills required to conduct a research
- CO3:** To understand how to conduct a research in an industrial setting
- CO4:** Applying statistical analyses to analyze the data collected
- CO5:** Interpreting and reporting the obtained results
- CO6:** Giving suggestions to the organizations based on the findings of the study

SEMESTER IV-

PAMAPSY401

CONSUMER PSYCHOLOGY

The learner will be able

- CO1:** To understand the concept, theoretical approaches and methodological issues in consumer behaviour
- CO2:** To understand the implicit consumer cognition
- CO3:** To understand the nature and role of affect in consumer behaviour
- CO4:** To understand the Role of Knowledge Accessibility in Cognition and Behavior
- CO5:** To understand the Implications of Consumer Information Processing
- CO6:** To understand the role of Consumer Expectations & Perceptions
- CO7:** To understand the dynamics of relationship between Brands and identity
- CO8:** To understand the how products prime social networks
- CO9:** To understand the relationship between aging and consumer behavior
- CO10:** To understand the advanced research methods to examine different aspects of consumer behaviour

PAMAPSY402

INNOVATION AND CHANGE MANAGEMENT

The learner will be able

- CO1:** To understand the importance of Creativity in the work place
- CO2:** To understand the processes of innovation and change
- CO3:** To understand the process of organizational change
- CO4:** To understand the external and organizational pressures for change
- CO5:** To understand the causes and consequences of resistance to organizational change
- CO6:** To understand the various models of change
- CO7:** To understand the different Organizational Change Interventions including Human Process Intervention, Techno-structural intervention, Human Resource Intervention and Strategic Intervention
- CO8:** To understand how Organizational Change can be implemented

CO9: To understand the hard side of change management

PAMAPSY403

PERSONNEL PSYCHOLOGY

The learner will be able

CO1: To understand the concept and objectives of personnel management

CO2: To understand the pre-requisites, tools, techniques and methods needed to achieve the objectives of personnel management

CO3: To understand the functions of personnel management

CO4: To understand Personnel management in India

CO5: To understand the need, benefits, process and responsibility for human resource planning

CO6: To understand the recruitment and selection process

CO7: To understand the concept of promotions, transfers, separation, absenteeism, turnover and Executive development

CO8: To understand job evaluation techniques and the process of wage and salary administration

CO9: To understand the importance of rewards and incentives

CO10: To understand employee benefits and employee services

CO11: To understand the importance of employee safety and health

CO12: To understand the nature of industrial disputes & industrial relations; and the role of trade unions

PAMAPSY4

INTERNSHIP

The learner will be able

CO1: To apply the theoretical knowledge gained from classroom setting to the organizational setting

CO2: To get first-hand experience into the working of an organization

CO3: To increase the employability of the Learners who complete this program

MASTER OF ARTS IN ECONOMICS

PROGRAMME OUTCOMES:

The learner will be

- PO1:** Well versed with the core theoretical and empirical foundations of economics.
- PO2:** Able to understand that economists are what they do.
- PO3:** Able demonstrate economic way of thinking.
- PO4:** Able to exercise specialized knowledge and skills to articulate facts, beliefs and methods of inquiry used for economic analysis.
- PO5:** Able to respect conflicting views as economists can agree to disagree and use various analytical skills acquired to contest them.
- PO6:** Able to creatively explore, formulate, implement and examine public policies for addressing economic challenges.
- PO7:** Able to employ effective modes of communication within the discipline that respond to the purpose, context, and audience.
- PO8:** To evaluate various career choices based on specializations available.

PROGRAMME SPECIFIC OUTCOMES:

- PO1:** acquisition of subject knowledge and understanding of the principles of both micro and macroeconomics and its applications in the real world.
- PO2:** PSO2: demonstrate higher order cognitive skills beyond memorization, such as formulating questions, interpreting data, and constructing and deconstructing arguments.
- PO3:** display an array of discipline specific competencies - to explain, analyze, predict, ask and create.
- PO4:** read popular press writings on economic issues and review research articles published in reputed economic journals.
- PO5:** possess a working knowledge of basic tools of econometrics and statistical software 'R'.
- PO6:** execute a live research project on contemporary issues.
- PO7:** acquisition of independent learning skills.

SEMESTER I

MICROECONOMICS – I

The learner will be able to

- CO1:** Understand the fundamental principles of microeconomics and decision making behavior of microeconomic agents.
- CO2:** Describe the relevance of microeconomic phenomena in the real world.
- CO3:** Apply advanced mathematical tools for microeconomic analysis.
- CO4:** Understand the theories of consumer behaviour and develop tools for representation of optimal consumer choice.
- CO5:** Interpret the nature of consumer choices and advances to the consumer theories.
- CO6:** Describe the theories of production behaviour and develop tools for representation of efficiency and optimality in production.
- CO7:** Comprehend the application of consumer theories to the modern structure of the firm.

MATHEMATICS FOR ECONOMISTS

The learner will be able to

- CO1:** Understand the basic mathematical techniques of economic analysis.
- CO2:** Use basic calculus for univariate and multivariate functions.
- CO3:** Comprehend economic applications of calculus and linear algebra.

ECONOMETRICS - I

The learner will be able to

- CO1:** Well versed with the basic tools of econometric analysis.
- CO2:** Comprehend the relevance of elementary probability theory in economics.
- CO3:** Familiar with the idea of a random variable, its mathematical expectation and variance along with the properties of theoretical probability distributions.
- CO4:** Use statistical inference theory for hypothesis testing.

INTRODUCTION TO R SOFTWARE

The learner will be able to

- CO1:** Well versed with R preliminaries.
- CO2:** Familiar with data frames, data vectors and execution of R commands.
- CO3:** Drawing a sample from a population using R software.
- CO4:** Using R software for data presentation and tabulation.

MACROECONOMICS – I

The learner will be able to

- CO1:** Understand the starting point of macroeconomics with the help of indicators of production and employment.
- CO2:** Be familiar with the advances to macroeconomic theories in understanding the nature and circulation of money.
- CO3:** Understand the simple Keynesian model and policies of stabilization.
- CO4:** Apply the IS-LM model to study the impact of real and monetary influences on the economy.
- CO5:** Analyze macroeconomic controversies.

DEVELOPMENT ECONOMICS

The learner will be able to

- CO1:** Understand the nature and subject matter of development economics.
- CO2:** Describe and criticize the modern theories of development.
- CO3:** Analyze the microeconomics of development in relation to land, labour, capital and credit markets.
- CO4:** Familiar with macroeconomics of development in relation to trade and environment.

ECONOMETRICS - II

The learner will be able to

- CO1:** Well versed with the basic concepts of econometric models and model specification.
- CO2:** Have basic understanding of simple and multivariable regression modelling in econometrics.
- CO3:** Comprehend the major problems in simple linear regression modelling such as heteroskedasticity, multi-collinearity and auto-correlation.
- CO4:** Familiar with basic fundamentals of time series econometrics.

STATISTICAL COMPUTING USING R SOFTWARE

The learner will be able to

- CO1:** Draw measures of central tendency and dispersion for different types of data using R.
- CO2:** Compute probabilities for theoretical probability distributions in R.
- CO3:** Run a simple and multiple linear regression in R.
- CO4:** Use R for hypothesis testing-small and large samples.

MICROECONOMICS - II

The learner will be able to

- CO1:** Understand the characteristics and working of imperfectly competitive market models like monopoly, monopolistic competition, and oligopoly.
- CO2:** Comprehend and apply the concepts of game theory for microeconomic analysis.
- CO3:** Assess behavioral economics.

INTERNATIONAL TRADE: THEORY AND POLICY

The learner will be able to

- CO1:** Describe and evaluate classical, neo classical and modern theories of international trade and discuss their application to the real world.
- CO2:** Compare various trade policies, their effects, and relative advantages and disadvantages.

BANKING: THEORY AND PRACTICE

The learner will be able to

- CO1:** Familiar with the origin and evolution of banking system in India.
- CO2:** Be well versed with banking instruments and technology.
- CO3:** Comprehend the regulatory and supervisory framework of banking system.
- CO4:** Examine the banker customer relationship and practical needs of the banking industry.

DEMOGRAPHY: THEORY AND BASIC ANALYSIS

The learner will be able to

- CO1:** Understand the relationship between population science, demography and economic development.
- CO2:** Comprehend the concept, determinants and measures of nuptiality, fertility and mortality.
- CO3:** Familiar with the concept, uses and construction of life tables.
- CO4:** Use vital statistics for basic demographic analysis.
- CO5:** Analyze theories of migration and methods of population projection.

MACROECONOMICS – II

The learner will be able to

- CO1:** Compare the Classical and Keynesian theories of aggregate demand and supply.
- CO2:** Analyze the monetarist versus Keynesian views on output, inflation, and unemployment.
- CO3:** Be familiar with real business cycles and new Keynesian economics.
- CO4:** Describe various perspectives in relation to severe supply disruption, sticky prices and the Great Depression.

INTERNATIONAL FINANCE

The learner will be able to

- CO1:** Understand the nature, scope and subject matter of international finance.

- CO2:** Be familiar with foreign exchange rates, markets and risk exposures.
- CO3:** Examine the various approaches to balance of payments adjustments.
- CO4:** Comprehend international dimensions of cash management, portfolio investment and capital budgeting.
- CO5:** Be well versed with the operations of international financial institutions.

FINANCIAL ECONOMICS

The learner will be able to

- CO1:** Understand the nature, scope and subject matter of financial economics.
- CO2:** Familiar with the basic terminology of investment and portfolio analysis.
- CO3:** Knowledge of capital asset pricing model and sources of corporate finance.
- CO4:** Be well versed with meaning, participants, types and functions of derivatives.

RESEARCH PROJECT

The learner will be able to

- CO1:** Apply critical thinking and reasoning ability for planning and conducting formal economic research.
- CO2:** Be well versed with APA style of referencing, especially in text referencing and citations.
- CO3:** Undertake review of literature using plagiarism guidelines.
- CO4:** Formulate a research problem and chart out conceptual framework highlighting the research methodology.
- CO5:** Apply econometric, mathematical and statistical skills imbibed across the entire program for conducting research.
- CO6:** Use statistical software such as Excel and R for data management and analysis.
- CO7:** Document the research findings as per the accepted norms.

Master of Commerce

PROGRAM OUTCOME

- PO1:** Advanced knowledge of Marketing, Management and Finance.
- PO2:** Expertise in Accounting, Auditing and Taxation
- PO3:** Professional Ethics and Values
- PO4:** Self-confidence about future career
- PO5:** Offer a number of job oriented courses

PROGRAM SPECIFIC OUTCOME

Towards the end of this program, learners will be able to:

- PSO1:** Understand the application of IND-AS, IFRS for Companies.
- PSO2:** Know the Accounting & taxation system of India.
- PSO3:** Aware of the importance and relevance of marketing in today's business world.
- PSO4:** Ability to Manage Business thus contributing towards the development of Indian Economy.
- PSO5:** Ability to apply Banking & Financial Sector's knowledge into practice.
- PSO6:** Aware of the importance and relevance of HR & management in today's business world.
- PSO7:** Sensitize Professional Ethics and Social Values.

SEMESTER I

PCMAMCOMA101/PCMAMCOMB101

Strategic Management

Learner would be able to,

- CO 1:** understand new forms of Strategic Management concepts and their use in business
- CO 2:** develop learning and analytical skills to enable them to solve cases and to provide strategic solutions
- CO 3:** acquaint with recent developments and trends in the business corporate world

PCMAMCOMA102/PCMAMCOMB102

Economics for Business Decisions

Learner would be able to,

- CO1:** Equip with basic tools of economic theory and its practical applications
- CO2:** Provide an insight into application of economic principles in business decisions, it also intends to widen analytical ability of the students and to provide them a foundation for further study of economics
- CO3:** Understand of the economic aspects of current affairs and thereby prepares them to analyse the market behaviour with economic way of thinking

PCMAMCOMA103/PCMAMCOMB103

Cost and Management Accounting

Learner would be able to,

- CO1:** Understand, develop and apply the techniques of costing in the decision making in the business corporates
- CO2:** Develop the concept of Cost and management accounting and its significance in the business

PCMAMCOMA104/PCMAMCOMB104

Business Ethics and Corporate Social Responsibility

Learner would be able to,

CO 1: Understand the concept and relevance of Business Ethics in the modern era

CO 2: Understand the scope and complexity of Corporate Social responsibility in the global and Indian context

SEMESTER II

PCMAMCOMA201/ PCMAMCOMB201

Research Methodology for Business

Learner would be able to,

CO 1: Undertake research in business & social sciences

CO 2: Understand, develop and apply the fundamental skills in formulating research problems

CO 3: Understand the basic statistical tools and techniques applicable for research

CO 4: Understand and develop the most appropriate methodology for their research

PCMAMCOMA202/PCMAMCOMB202

Macro Economics Concepts and Applications

Learner would be able to,

CO1: Receive a firm grounding on the basic macroeconomic concepts that strengthen analysis of crucial economic policies

CO2: Grasp fully the theoretical rationale behind policies at the country as well as corporate level

PCMAMCOMA203/ PCMAMCOMB203-Corporate Finance

Learner would be able to,

CO1: Understand, develop and apply the techniques of investment in the financial decision making in the business corporates

CO2: Enhance the abilities to analyse the financial statements

PCMAMCOMA204/ PCMAMCOMB204

E-Commerce

Learner would be able to,

CO1: Understand the emerging world of ecommerce

CO2: Familiar with current challenges and issues in ecommerce

CO3: Understand the Web- based Commerce and equip the learners to assess e-commerce requirements of a business

CO4: Understand Legal and Regulatory Environment and Security issues of E-commerce

SEMESTER III

Group A: Advanced Accounting, Corporate Accounting and Financial Management

PCMAMCOMA301

Advanced Financial Accounting

Learner would be able to,

CO1: Learn the accounting for Banking and Insurance Companies

CO2: Understand about foreign currency conversion as per accounting standard

CO3: Understand accounting for consumer cooperative society and cooperative housing society

PCMAMCOMA302

Direct Tax

Learner would be able to,

CO 1: Understand about residential status, taxable income and exempt income

CO 2: Calculate taxable income after allowable deductions as per Act

CO 3: Determine tax liability and file income tax return

PCMAMCOMA303

Advanced Cost Accounting

Learner would be able to,

CO1: Understand accounting for process and equivalent production as per FIFO & Weighted average method.

CO2: Understand cost allocation and activity based costing

CO3: Understand emerging cost concepts and accounting

PCMAMCOMAP31

Project work- I

Learner would be able to,

CO1: Apply research methodology in solving research problem

CO2: Do analysis and give interpretation and recommendation

CO3: Prepare Project report

Group B: Business Studies (Management)

PCMAMCOMB301

Human Resource Management

Learner would be able to,

CO1: Understand concept of Human resource management, its planning, recruitment & selection.

CO2: Understand training & performance appraisal

CO3: Know Latest Development in H.R.M. And Labour Legislation

CO4: Know emerging issues in HRM

PCMAMCOMB302

Entrepreneurial Management

Learner would be able to,

CO 1: Understand concept of entrepreneurship and theories

CO 2: Understand importance of family business and women entrepreneurship

CO 3: Get knowledge about Incentives for Promotion and Development of Entrepreneurship

PCMAMCOMB303

Marketing Strategies and practices

Learner would be able to,

CO 1: Understand new marketing strategies, marketing mix and marketing plan

CO 2: Know about environmental analysis, E –Marketing and Social marketing

CO 3: Understand about customer value and customer loyalty

PCMAMCOMBP31-Project work- I

Learner would be able to,

CO1: Apply research methodology in solving research problem

CO2: Do analysis and give interpretation and recommendation

CO3: Prepare Project report

SEMESTER IV

Group A: Advanced Accounting, Corporate Accounting and Financial Management

PCMAMCOMA401

Corporate Financial Accounting

Learner would be able to,

CO 1: Differentiate between IFRS & Ind-AS

CO 2: Calculate value of business in case of amalgamation and merger

CO 3: Prepare consolidated financial statement

PCMAMCOMA402

Indirect Tax- Introduction of Goods and Service Tax

Learner would be able to understand,

CO 1: Existing system in relation to GST

CO 2: GST Registration procedure and other provisions

CO 3: GST payment and return filing procedure along with computation of interest and penalty

CO 4: Specific provisions of Integrated Goods and Service Tax Act, 2017.

PCMAMCOMA403

Financial Management

Learner would be able to,

CO 1: Know about financial planning and corporate strategies

CO 2: Understand various techniques of capital budgeting

CO 3: Know about types of financing

CO 4: Manage working capital for business.

PCMAMCOMBP42-Project work- II

Learner would be able to,

CO1: Apply research methodology in solving research problem

CO2: Do analysis and give interpretation and recommendation

CO3: Prepare Project report

Group B: Business Studies (Management)

PCMAMCOMB401

Logistics & Supply Chain Management

Learner would be able to,

CO 1: Understand concept of logistics management

CO 2: Know about transportation, warehousing and packaging

CO 3: Understand Supply chain management and its perspectives

PCMAMCOMB402-Advertising and sales Management

Learner would be able to,

CO 1: Understand basics of advertising, Ad agencies and about media

CO 2: Know about research and legal framework of advertising

CO 3: Know about sales management, planning and controlling

PCMAMCOMB403

Retail Management

Learner would be able to,

CO 1: Understand concept of retail management and its strategies

CO 2: Know about Retail Location, Layout and Merchandising

CO 3: Use Technology and go for Career options

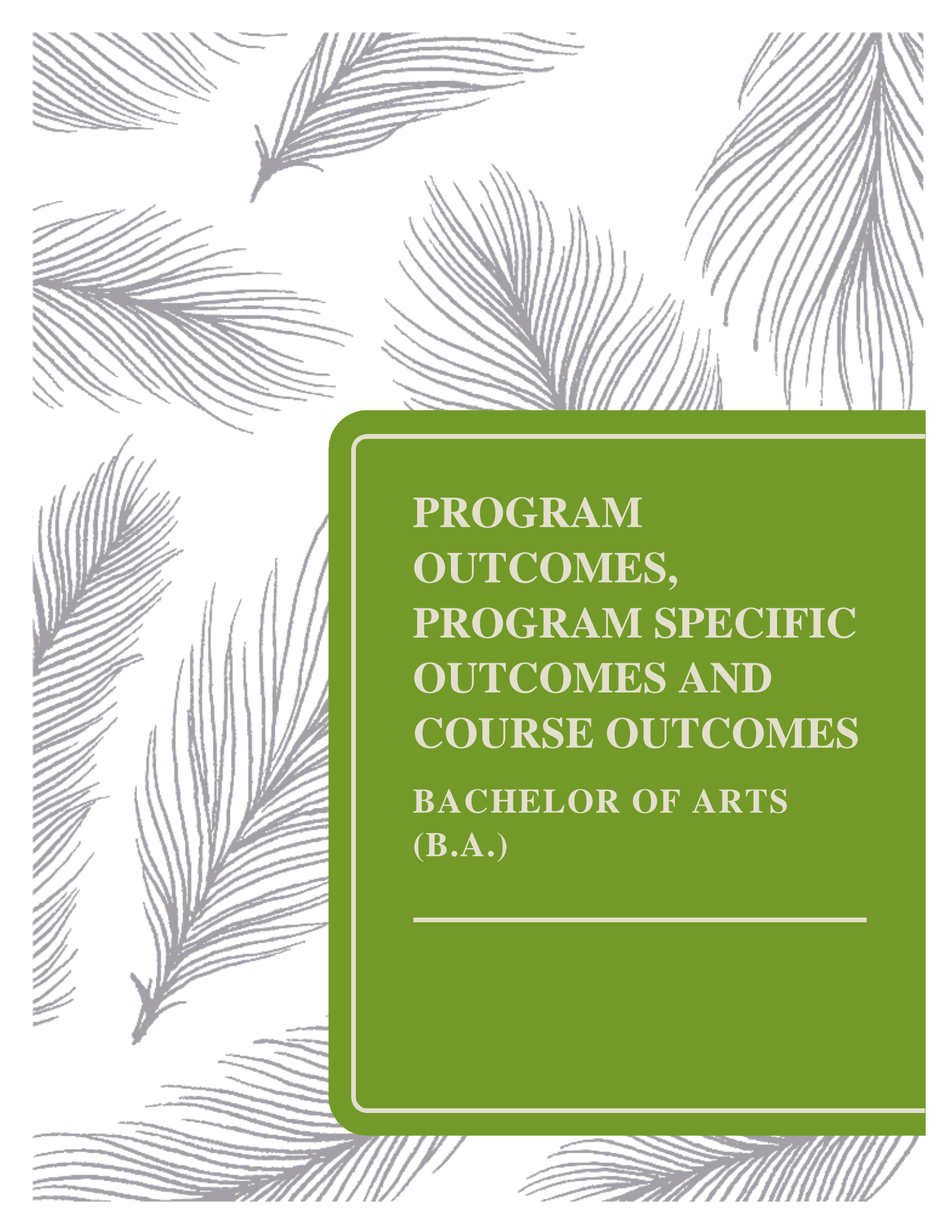
PCMAMCOMBP42-Project work- II

Learner would be able to,

CO1: Apply research methodology in solving research problem

CO2: Do analysis and give interpretation and recommendation

CO3: Prepare Project report



**PROGRAM
OUTCOMES,
PROGRAM SPECIFIC
OUTCOMES AND
COURSE OUTCOMES**

**BACHELOR OF ARTS
(B.A.)**

INTRODUCTION TO THE B.A. PROGRAM

AT MITHIBAI COLLEGE OF ARTS (AUTONOMOUS)

The Bachelor of Arts Program at Mithibai College of Arts (Autonomous) is structured to offer knowledge in a variety of contexts for learners. The program aims to offer education and skills that is accessible to learners belonging to different backgrounds across their professional and personal circumstances. The B.A. Program seeks to inculcate students with qualities such as a realization of human values, sense of social service, sense of responsibility and dutifulness, development of a critical temper and creative abilities, which would help with goal achievement in the future.

The B.A program has several primary learning objectives which are accomplished through a robust curriculum encompassed in the multitude of courses (viz. English, Economics, Hindi, Gujarati, Marathi, French, Political Science, Philosophy, Psychology and Sociology) offered by the college. The curriculum is revised and updated regularly through an active interaction with subject experts, industry experts and primary stakeholders (students). In addition, several meaningful learning experiences and opportunities are offered to the students, both inside and outside the classroom that enhance the learner's understanding and professional preparation and gives the student an upper hand in terms of their future employability.

PROGRAM OUTCOMES – BACHELOR OF ARTS (B.A.)

For the completion of the Bachelor of Arts Program, students are required to complete six semesters spanning across three years for completion of the program. The program *aims* to provide students with

- a sound knowledge base in their chosen area of study
- the ability to apply the knowledge they have acquired
- the ability to communicate effectively
- the ability to work both independently and collaboratively
- the skills to connect across geographical, disciplinary, social and cultural boundaries
- an understanding of the value of ethical behaviour
- the skills for independent and lifelong learning

The Program Outcomes (POs), i.e. the outcomes that learners of all undergraduate degree programs will be able to achieve at the time of graduation, include:

PO1. Critical Thinking: Take informed actions after identifying the assumptions that define our thinking and actions, critically evaluate information, check the validity of assumptions and develop different perspectives to analyse situations, ideas and decisions (at intellectual, social, organizational and emotional levels). Apply critical thinking in real world scenarios. Utilize analytical acquired to facilitate an entry into the job market.

PO2. Effective Communication: Speak, read, write and listen in person and through electronic media in more than one language; find meaning by connecting ideas encountered across people, books, media and technology; and develop program-specific technical language. Apply effective communication skills in real world scenarios. Utilize soft skills acquired to facilitate an entry into the job market.

PO3. Social Interaction: Understand people's frame of reference and viewpoints, mediate between disagreement and conflicts using information literacy; demonstrate effective people's skills as well as team building and management skills. Appreciate the diversity of opinions, cultures, beliefs and perspectives.

PO4. Effective Citizenship: Demonstrate empathetic social concern and equity-centred national development; demonstrate an ability to act within an informed awareness of issues and participate in civic life through community services. Uphold rationality and ethical values in the pursuit of effective citizenship.

PO5. Ethical Practices: Recognize the different value systems including learner's specific surroundings, understand the moral dimensions of one's own decisions and accepting responsibility for them.

PO6. Environment & Sustainability: Understand the issues and concerns in an environmental context and contribute towards sustainable development of humankind.

PO7. Self-directed & Life-long learning: Acquire the ability to engage in independent and life-long learning in the broadest context of psycho-socio-technological changes. Pursue the ideal of lifelong learning in a tech-savvy world.

PO8. Develop a comprehensive understand of social sciences - Understand the core foundations of social sciences.

**PROGRAM SPECIFIC OUTCOMES
AND
COURSE OBJECTIVES**

COMMERCE AND MANAGEMENT

PROGRAM SPECIFIC OUTCOMES – COMMERCE AND MANAGEMENT

- PSO1.** Understand the concepts related to commerce and business
- PSO2.** Learners gain the knowledge of Financial Management, Marketing Management, Human Resources Management and Production Planning and Quality Control.
- PSO3.** Learners were encouraged to become Entrepreneur with help of Subject Entrepreneurship Management.
- PSO4.** Learners were trained to become good and effective managers as various management concepts were taught in course.

COURSE OUTCOMES – COMMERCE AND MANAGEMENT

A. COURSE: INTRODUCTION TO BUSINESS I (PAPER I - F.Y.B.A - SEMESTER I)

- CO1.** Understand the term business and explain its functions.
- CO2.** Understand reconciliation of economic objectives with social objectives.
- CO3.** Understand factors influencing choice of business organization.
- CO4.** Elucidate the different forms of business organization
- CO5.** Understand the elements of business environment.
- CO6.** Help the learner understand major trading blocs.
- CO7.** Examine social responsibilities of business towards various stakeholders.
- CO8.** Help the learner understand concepts of business ethics with examples.

B. COURSE: PRINCIPLES OF MANAGEMENT II (PAPER I - F.Y.B.A- SEMESTER II)

- CO1.** Help the learner understand various functions of management.
- CO2.** Elucidate various skills required to become effective manager.

- CO3. Help the learner understand different methods of decision making.
- CO4. Understand MBO.
- CO5. Help the learner understand formal and informal organization.
- CO6. Elucidate the bases of departmentation.
- CO7. Elucidate the relationship between planning and controlling.
- CO8. Understand reporting as a tool of controlling.

C. COURSE: FINANCE AND PRODUCTION MANAGEMENT III (PAPER II - S.Y.B.A - SEMESTER III)

- CO1. Understand objectives of financial management.
- CO2. Help the learner understand the various types of leverages with suitable examples.
- CO3. Help the learner distinguish between fundamental analysis and technical analysis.
- CO4. Understand the role of venture capitalist in the formation business.
- CO5. Elucidate steps in production planning and control.
- CO6. Develop an awareness of the factors influencing productivity.
- CO7. Understand the concepts of product and services quality.
- CO8. Understand the SERVEQUAL Model.

D. COURSE: MARKETING MANAGEMENT IV (PAPER III - S.Y.B.A - SEMESTER III)

- CO1. Help the learner understand the evolution of marketing with suitable examples.
- CO2. Help the learner understand customer Relationship Management with examples.
- CO3. Develop an awareness of the marketing mix during various stages of Product Life Cycle.
- CO4. Develop an awareness of the different reasons for brand extension
- CO5. Develop an awareness of factors influencing pricing.
- CO6. Examine process of Integrated Marketing Communication.
- CO7. Understand Supply Chain Management.
- CO8. Understand prospects and challenges of Rural Marketing.

E. COURSE: HUMAN RESOURCE MANAGEMENT V (PAPER II - S.Y.B.A - SEMESTER IV)

- CO1. Understand various functions of human resource management.
- CO2. Help the learner distinguish between recruitment and selection.
- CO3. Understand essential sound training programme.
- CO4. Help the learner explain techniques of performance appraisal.
- CO5. Help the learner understand Blake and Mouton Managerial Grid.
- CO6. Help the learner understand factors influencing emotional quotient and spiritual quotient.
- CO7. Help the learner understand William Ouchi's Theory Z.
- CO8. Make known the causes of low employee morale and measures to overcome it.

F. COURSE: ENTREPRENEURSHIP MANAGEMENT VI (PAPER III - S.Y.B.A - SEMESTER IV)

- CO1. Help the learner distinguish between entrepreneurs and intrapreneurs.
- CO2. Help the learner understand various theories of entrepreneurship.
- CO3. Understand Business Life Cycle.
- CO4. Help the learner understand the different types of feasibility study
- CO5. Make known the factors influencing fixed and working capital requirements of a firm.
- CO6. Help the learner explain the process of obtaining bank loans.
- CO7. Help the learner understand various techniques of CRM.
- CO8. Make known recent trends in distribution.

G. COURSE: ADVERTISING AND SALES MANAGEMENT (APPLIED COMPONENT - S.Y.B.A - SEMESTER III)

- CO1. Help the learner define the term advertising and explain its objectives.
- CO2. Help the learner explain the process of creative pitch with example.
- CO3. Understand ASCI and Doordarshan Code.
- CO4. Help the learner understand the different methods for calculating advertising budget?

- CO5. Help the learner understand the need and importance of creativity in advertising.
- CO6. Understand the process of developing USP.
- CO7. Understand the principles of Layout.
- CO8. Understand the bases for writing slogans and taglines.

**H. COURSE: ADVERTISING AND SALES MANAGEMENT (APPLIED COMPONENT
- S.Y.B.A - SEMESTER IV)**

- CO1. Elucidate the various functions of sales management.
- CO2. Understand the various qualities required to become effective sales personnel.
- CO3. Understand the different methods of sales forecasting.
- CO4. Elucidate the personal selling process.
- CO5. Help the learner understand After Sale Services.
- CO6. Understand the importance of discounts.
- CO7. Elucidate the various techniques of training.
- CO8. Help the learner understand Succession Planning.

ECONOMICS

PROGRAM SPECIFIC OUTCOMES – B.A. ECONOMICS

- PSO1.** Understand the theoretical foundations of economics.
- PSO2.** Apply economic theory for economic analysis, forecasting and policy making, in the context of real world issues.
- PSO3.** Identify economic problems and use qualitative and quantitative tools for building econometric models, testing the validity of theory and drawing inferences for suggesting possible solutions to the problem.
- PSO4.** Use latest statistical software tools such as excel and r for economic modelling of research problems and quantitative analysis.
- PSO5.** Thorough exposition of contemporary economic issues through debates, discussions, research and report writing.
- PSO6.** Apply critical thinking and reasoning ability for conducting review of literature, undertaking formal economic research and effectively communicating the research outcomes.

COURSE OUTCOMES – B.A. ECONOMICS

A. COURSE: MICROECONOMICS – I (PAPER I – FYBA – SEMESTER I)

- CO1.** Understand the fundamental principles of microeconomics and decision making behaviour of microeconomic agents.
- CO2.** Describe the relevance of microeconomic phenomena in the real world.
- CO3.** Apply basic mathematical tools for microeconomic analysis such as graphs and linear functions.
- CO4.** Understand the idea of an economic model and role of assumptions with examples like the Circular Flow Model.
- CO5.** Apply market structure analysis, cost and pricing strategies to real life situations.

B. COURSE: MACROECONOMICS – I (PAPER I – FYBA – SEMESTER II)

- CO1. Understand the fundamental principles, nature, scope and subject matter of macroeconomics.
- CO2. Describe and classify the various constituents of a closed and open economy.
- CO3. Measure economic variables like GDP, inflation, unemployment, consumer price index, GDP deflator, investment multiplier, etc.
- CO4. Present formal models of income determination.

C. COURSE: MICROECONOMICS – II (PAPER I – SYBA – SEMESTER III)

- CO1. Understand the fundamental concepts in microeconomics.
- CO2. Describe the relevance of microeconomic phenomena in the real world.
- CO3. Understand and apply utility analysis to demand behaviour of consumers and production analysis to the decision making of firms.
- CO4. Describe the features and working of market structures including perfect competition and monopoly, using tools of microeconomic analysis.

D. COURSE: ELEMENTARY MATHEMATICAL AND STATISTICAL TOOLS FOR ECONOMIC ANALYSIS – I (PAPER III – SYBA – SEMESTER III)

- CO1. Comprehend economic applications of equations.
- CO2. Collect data and present it in various forms for economic interpretation.
- CO3. Understand the relevance of quantitative tools in measurement of economic variables and models.
- CO4. Use basic calculus for univariate and multivariate functions and application of the measures of central tendency.

E. COURSE: MACROECONOMICS – II (PAPER II – SYBA – SEMESTER IV)

- CO1.** Understand the basic concepts of macroeconomics.
- CO2.** Describe the relevance of macroeconomic phenomena such as money supply, inflation and unemployment in the real world.
- CO3.** Interpret RBI measures of liquidity in India.
- CO4.** Describe the general equilibrium framework of IS–LM and AD-AS models.
- CO5.** Analyse the effectiveness of macroeconomic policies in the context of inflation and unemployment.

F. COURSE: ELEMENTARY MATHEMATICAL AND STATISTICAL TOOLS FOR ECONOMIC ANALYSIS – II (PAPER III – SYBA – SEMESTER IV)

- CO1.** Understand the application of basic mathematical and statistical tools for economic analysis.
- CO2.** Use mathematical tools such as integration and matrix algebra in measurement of economic phenomena
- CO3.** acquire knowledge of basic statistical techniques of calculating and interpreting measures of dispersion and index numbers.

G. COURSE: MICROECONOMICS - III (PAPER IV – TYBA – SEMESTER V)

- CO1.** Understand the characteristics and working of imperfectly competitive market models like monopolistic competition, collusive and non-collusive oligopoly.
- CO2.** Understand and apply the concepts of game theory and Nash equilibrium to economic events.
- CO3.** Analyse the criteria of social welfare and apply the general equilibrium framework in the context of welfare economics.
- CO4.** Describe market failures using examples of asymmetric information, adverse selection, moral hazard, market signalling and the principal - agent problem.

H. COURSE: ECONOMICS OF DEVELOPMENT (PAPER V – TYBA – SEMESTER V)

- CO1.** Understand the concepts and models of growth and development ranging from the traditional to modern such as Sen's Capabilities Approach.
- CO2.** Describe the concepts of human and sustainable development, HDI and GDI.
- CO3.** Analyse the classical and the contemporary theories of growth and development that have evolved in the recent years.
- CO4.** Describe and analyse the policies adopted across the world economy for alleviation of problems such as overpopulation, poverty and income inequalities.

I. COURSE: INDUSTRIAL AND LABOUR ECONOMICS (PAPER VI – TYBA - SEMESTER V)

- CO1.** Understand the fundamental concepts of industrial and labour economics.
- CO2.** Describe the structure and profile of the Indian industrial sector and the dynamic changes since globalization and liberalization with reference to mergers, acquisitions and global value chains.
- CO3.** Analyse the theories of industrial location and discuss the problem of dispersion and regional imbalance.
- CO4.** Describe and analyse the issues of industrial productivity and industrial sickness.
- CO5.** Understand and analyse the problems and reforms in the Indian labour market.

J. COURSE: MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS (PAPER VII – TYBA – SEMESTER V)

- CO1.** Understand the basic mathematical and statistical techniques of economic analysis.
- CO2.** Apply advanced calculus, higher order derivatives and matrix algebra for economic analysis.
- CO3.** Interpret the application of correlation and regression techniques in formulating economic relationships.
- CO4.** Comprehend the relevance of elementary probability theory in economics.

K. COURSE: INTRODUCTION TO ECONOMETRICS (PAPER VIII – TYBA – SEMESTER V)

- CO1. Understand the basic concepts of econometric analysis.
- CO2. Understand the concept of a discrete and continuous random variable, its mathematical expectation and variance along with the properties of theoretical probability distributions.
- CO3. Use statistical inference theory for hypothesis testing.
- CO4. Apply classical linear regression model for validation of economic theory.

L. COURSE: PROJECT (PAPER IX– TYBA – SEMESTER V)

- CO1. Apply critical thinking and reasoning ability for planning and conducting formal economic research.
- CO2. Use a variety of qualitative and quantitative tools for the purpose of doing research.
- CO3. Use statistical software such as excel for data management and analysis.
- CO4. Communicate effectively the findings of the research undertaken.

M. COURSE:MACROECONOMICS – III (PAPER IV– TYBA – SEMESTER VI)

- CO1. Understand basic concepts of open economy macroeconomics such as balance of payments, exchange rates and working of the foreign exchange market.
- CO2. Understand and analyse the monetary approach to balance of payments.
- CO3. Compare the advantages and disadvantages of fixed and flexible exchange rates and discuss the relevance of Mundell Fleming model in the context of impossible trinity.
- CO4. Describe the evolution of international monetary history leading up to the Global financial crisis and Euro crisis.

N. COURSE: INTERNATIONAL ECONOMICS (PAPER V– TYBA – SEMESTER VI)

- CO1.** Understand the nature, scope and subject matter of international economics.
- CO2.** Analyse international factor movements and trade controversies.
- CO3.** Describe the various forms of economic integration such as SAARC, ASEAN.
- CO4.** Compare the various instruments of trade policy and their relative advantages and disadvantages.
- CO5.** Describe and evaluate the theories of international trade and discuss their application to the real world.

O. COURSE: INDIAN FINANCIAL SYSTEM (PAPER VI– TYBA – SEMESTER VI)

- CO1.** Understand the various components of Indian financial system and indicators of financial development.
- CO2.** Analyse financial sector reforms since 1990s.
- CO3.** Familiarize with the operations and growth of financial markets and services.
- CO4.** Examine RBI's monetary policy and transmission mechanism of monetary policy.
- CO5.** Describe and evaluate the developments in the Indian banking sector since 1990s.

P. COURSE: MATHEMATICAL AND STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS (PAPER VII– TYBA – SEMESTER VI)

- CO1.** Understand the basic mathematical and statistical techniques of economic analysis.
- CO2.** Comprehend the economic applications of advanced calculus such as partial derivatives and integration.
- CO3.** Apply time series analysis for economic forecasting of trends and measurement of seasonal variations.
- CO4.** Use vital statistics for basic demographic analysis.

Q. COURSE: INTRODUCTION TO ECONOMETRICS (PAPER VIII – TYBA – SEMESTER VI)

- CO1.** Understand the basic concepts of econometric models and model specification.
- CO2.** Analyse the meaning, detection, measures and consequences of failures of classical assumptions of classical linear regression model such as heteroskedasticity, multicollinearity and auto-correlation.
- CO3.** Apply various methods of economic forecasting and use of different measures of forecast performance.
- CO4.** Understand the use and application of linear programming problem and transportation problem.

R. COURSE: PROJECT (PAPER IX– TYBA – SEMESTER VI)

- CO1.** Understand APA style of referencing, especially in text referencing and citations.
- CO2.** Undertake review of literature using plagiarism guidelines.
- CO3.** Formulate a research problem and chart out conceptual framework highlighting the research methodology.
- CO4.** Apply econometric, mathematical and statistical skills imbibed across the entire program.
- CO5.** Document the research findings as per the accepted norms.

ENGLISH

PROGRAM SPECIFIC OUTCOMES – ENGLISH

- PSO1.** Demonstrate a clear ability to express in English in all the four skills (reading, writing, listening and speaking).
- PSO2.** Have an understanding of the social backgrounds and historical facts that influenced the British literature, American Literature and Indian English Literature through ages
- PSO3.** Display a broad knowledge of the major writers and their works from British, American and Indian Literature
- PSO4.** Have an ability to read, understand and critically evaluate works in different genres of literature
- PSO5.** Be able to articulate clear and lucid opinions and viewpoints about a text and its various aspects
- PSO6.** Display sensitivity and understanding of various cultures other than the one that is native to the student
- PSO7.** Be able to engage in fruitful and enriching dialogue with other peers, critics and intellectuals in the domain of literature
- PSO8.** Be able to apply the understanding of human nature and social behaviour to function in a humane way in the society
- PSO9.** Should be able to use, evaluate and integrate published scholarship into their own research papers giving due credit
- PSO10.** Be able to carry out independent research in interdisciplinary areas and write highly effective and original research papers

COURSE OUTCOMES – B.A. ENGLISH

A. COURSE: INTRODUCTION TO LITERATURE (PAPER I – FYBA – SEMESTER I & II)

- CO1. To acquaint students with the characteristics of various literary genres
- CO2. To develop analytical skills and critical thinking through close reading of literary texts
- CO3. TO cultivate appreciation of language as an artistic medium and to help them understand the importance of forms, elements and style that shape literary works
- CO4. To understand that literature is an expression of human values within a historical and social context
- CO5. To write clearly, coherently and effectively about various genres of literature
- CO6. To recognize the culture and context of the work of literature
- CO7. To develop sensitivity to nature and fellow human beings

B. COURSE: INDIAN LITERATURE IN ENGLISH (PAPER II – SYBA – SEMESTER III & IV)

- CO1. To understand the uniqueness of Indian Literature in English
- CO2. To understand the writings in different genres of Indian Literature in English
- CO3. To familiarize students with different perspectives and approaches to reading literature
- CO4. To create awareness of prominent Indian Writers in English
- CO5. To recognize the background influences that have driven the writing.
- CO6. To identify and critically examine elements of postcolonialism in Indian English writing.
- CO7. To critically appreciate works by Indian writers.

C. COURSE: AMERICAN LITERATURE (PAPER III – SYBA – SEMESTER III & IV)

- CO1. To acquaint students with the various genres and literary terms of twentieth century American Literature
- CO2. To sensitize students to the themes and styles of American Literature

- CO3. To develop an understanding of the socio-cultural milieu of twentieth century America through literary texts
- CO4. To develop an enhanced understanding of American, African American, Hispanic, Jewish, diasporic sensibilities in literature
- CO5. To have a cross-cultural perspective of American Literature
- CO6. To recognize the background influences that have driven the writing.
- CO7. To critically appreciate the pluralistic aspect of American literature and co-relating its similarities with Indian realities.

D. COURSE: MASS COMMUNICATION (APPLIED COMPONENT – SYBA – SEMESTER III & IV)

- CO1. To define and explain the nature of Communication and Mass communication
- CO2. To have knowledge of the history and current status of different media like newspaper, radio, television and cinema in India
- CO3. To be able to define various media types & presentation Formats: their nature, function and target audience
- CO4. To be able to explain the special roles that mass media plays in Indian development
- CO5. To be able explain media related laws and issues in India
- CO6. To have an understanding of the various career options in mass media and enable a student to take up mass media career.

E. COURSE: LITERARY ERA I & II (PAPER IV – TYBA – SEMESTER V & VI)

- CO1. To expose the learner to a variety of genres, styles and themes of British literature from 16th to 18th century.
- CO2. To help the learner identify and analyse themes of place, gender, class, religion, race, nationality and party politics specific to this literature
- CO3. To instil knowledge of the background influences that shaped the writers' thinking of that era
- CO4. To help the learner understand the literary masters who dominated those centuries

CO5. To critically appreciate the aesthetics of writings of that age.

F. COURSE: LITERARY THEORY AND PRACTICAL CRITICISM (PAPER V – TYBA – SEMESTER V & VI)

CO1. To help the learner understand the basic tenets of literary criticism down the history

CO2. To equip the learner with the skills to transact the literary text and the practice of literature

CO3. To use the technique of close reading of literary texts

CO4. To form the links between the different theories and the context in which they were formed

CO5. To recognise the multidisciplinary and multidimensionality of the study of literatures

CO6. To apply various literary theories to the reading of a text and thus, interpret a text from multiple perspectives.

CO7. To develop sharpened critical skills in the reading of text and enhanced ability for research in the domain of literature.

G. COURSE: GRAMMAR AND ART OF WRITING (PAPER VI – TYBA – SEMESTER V & VI)

CO1. To develop an insight in the process of word formation and transformation.

CO2. To develop an insight into the structure of English language and developed skills of grammatical analysis and description

CO3. to provide knowledge of the underlying ‘rules’ of grammar.

CO4. To have an understanding of the rhetorical structures for effective writing.

CO5. To develop an understanding of the contemporary grammatical framework that draws heavily from both the long-established tradition and on the insights of several contemporary schools of linguistics thus developing a new insight into English language and its functioning.

CO6. To understand the variations in English on the basis of geographical location, age, culture and gender and be able to employ it for effective writing in the language.

H. COURSE: LITERARY ERA III & IV (PAPER VII – TYBA – SEMESTER V & VI)

- CO1. To develop an understanding of English Literature of the 19th century – of the Romantic Revival and the Victorian period.
- CO2. To understand how background influences shaped the writer’s thinking.
- CO3. To have an understanding of the revolutionary nature of the Romantic Period and the emphasis on morality during the Victorian Period
- CO4. To acquaint students with the notable literature of the age
- CO5. To be familiar with the different mediums of the age like poetry, novel and non-fictional prose
- CO6. To have an understanding of the importance of women writing during the Romantic and Victorian Age, their position and sensibility

I. COURSE: 20TH CENTURY BRITISH LITERATURE (PAPER VIII – TYBA – SEMESTER V & VI)

- CO7. To familiarize the learners with the twentieth century literary movements
- CO8. To develop understanding of the modernist and postcolonial literary texts
- CO9. To acquaint students with the notable literature of the age
- CO10. To acquaint students with the different genres of the age like poetry, novel, play and short stories

J. COURSE: LITERATURE AND GENDER (PAPER IX – TYBA – SEMESTER V & VI)

- CO1. To acquaint students with the basic concepts in Gender Studies, Sex and Gender, Construction of Gender and Identity, Dimensions of Gender Oppression – race, class, caste, religion and how social structures reinforce these
- CO2. To develop an understanding and be able to examine the ways in which race, caste, class, religion, nationality shape gender realities.
- CO3. To develop an awareness of the fact that the oppression of people of colour usually takes place at the intersections of race, gender, class and caste.

- CO4.** To be able analyse sex and gender roles and identities, explore realities, understand and apply feminist theories and methodologies with respect to literature.
- CO5.** To be able to identify the gender politics and patriarchy that underlies most structures in the society through a thorough understanding of how it underlies in literature itself.
- CO6.** To critically reread canonical texts from a gendered perspective
- CO7.** To appreciate the subversive tools that the marginalized gender employs to voice the concerns of the suppressed through literature.
- CO8.** To sensitively respond to the issues of gender oppression, gender identities issues and other forms of suppression that other marginalized people undergo in the society.

GUJARATI

PROGRAM SPECIFIC OUTCOMES – B.A. GUJARATI

- PSO1.** Understand the importance of Gujarati literature.
- PSO2.** Language acquisition and development.
- PSO3.** Language learning: a shared responsibility.
- PSO4.** Thinking and learning through the Gujarati language.
- PSO5.** Viewing and representing texts, listening and speaking, reading and writing

COURSE OUTCOMES – B.A. ECONOMICS

A. COURSE: CONTEMPORARY GUJARATI LITERATURE – I & II (PAPER I– FYBA – SEMESTER I & II)

- CO1.** To understand the fundamental principles, nature, scope and subject matter of Gujarati literature.
- CO2.** To understand the basic knowledge of poems and short stories.
- CO3.** To provide advanced knowledge of poems, short stories and core studies for the same.
- CO4.** To understand literature, translation, and report writing at an advanced level.

B. COURSE: SELECTED POEMS AND SHORT STORIES- III & IV(PAPER II– SYBA – SEMESTER III & IV)

- CO1.** To identify the salient features of literary texts from a broad range of Gujarati literary periods
- CO2.** To equip students with argumentative and analytical skills to tackle different issues.
- CO3.** To acquaint students with contemporary literature questions and issues.

C. COURSE: INTRODUCTION TO MEDIEVAL GUJARATI LITERATURE - III & IV
(PAPER III– SYBA – SEMESTER III & IV)

- CO1. To acquaint students with basic questions that famous Gujarati authors in India have addressed.
- CO2. To understand basic study of medieval literature in Gujarati. (before Narsinh Mehta)
- CO3. To understand basic and advanced study of medieval literature in Gujarati. (after Narsinh Mehta)
- CO4. To acquaint students with advanced Gujarati literature questions that famous Gujarati authors in India and medieval tradition have addressed.
- CO5. To introduce students with different types of ‘sahitya swaroop’ and its use.

D. COURSE: THEORY OF LITERARY CRITICISM (PAPER IV– TYBA – SEMESTER
V & VI)

- CO1. To understand the basics and advanced knowledge of Indian and western literature.
- CO2. To understand the theory of literary criticism.
- CO3. To understand criticism in Indian and western Gujarati literature.
- CO4. To understand use and function of criticism in Indian and western Gujarati literature.

E. COURSE: HISTORY OF MODERN GUJARATI LITERATURE (PAPER V– TYBA –
SEMESTER V & VI)

- CO1. To understand the history of Gujarati literature
- CO2. To understand the different phases of Gujarati literature.
- CO3. To understand the famous authors and their efforts in Gujarati literature from Madhyakalin to Pandit Yug.
- CO4. To understand the types of writing in literature at a basic and advanced level
- CO5. To understand the History of modern Gujarati literature.
- CO6. To introduce the effect of the Gujarati writers in Gujarati literature.
- CO7. To understand famous authors and their efforts from Gandhiyug to Anu-Aadhunik Yug

F. COURSE: APPLIED NATURE RELATED TO CORE SUBJECT (PAPER VI– TYBA – SEMESTER V & VI)

- CO1. To know the value of core study in Gujarati literature
- CO2. To know the meaning and uses of the same word in different ways in Gujarati literature.
- CO3. To understand the role of the core subject in Gujarati literature.
- CO4. To understand the difference between Pandit Yug to Anu-adhunik yug.
- CO5. Learn to translate the Gujarati paragraph in English.

G. COURSE: PHILOLOGY, LINGUISTICS, GRAMMAR AND PROSODY (PAPER VII– TYBA – SEMESTER V & VI)

- CO1. To achieve an understanding of the overall structure, purpose and content of linguistics and grammar
- CO2. To achieve an understanding of the overall structure, purpose and content of Chhad abd Alankar
- CO3. To explore and interpret philology, linguistics, grammar and prosody.

H. COURSE: HISTORY OF LITERATURE (FROM MEDIEVAL TO MODERN AGE) (PAPER VIII– TYBA – SEMESTER V & VI)

- CO1. To introduce students to history of literature (from of medieval to modern age)
- CO2. To understand differences, progress and changes from medieval to modern Gujarati literature.
- CO3. To introduce students to the core subject as well as a detailed study of modern literature.

I. COURSE: CLOSE READING OF THE TEXTS (PAPER IX– TYBA – SEMESTER V & VI)

- CO1. To understand the meaning of close reading of the texts in different ways.
- CO2. To introduce different kinds of literature books and their use in literature studies.
- CO3. To understand the literature in research and experience.
- CO4. Introduction and a complete overview of Meerabai to modern authors.

CO5. To demonstrate knowledge of the history or culture of the Gujarati language (specialised knowledge)

CO6. To employ knowledge of literary traditions to produce imaginative writing.

HINDI

PROGRAM SPECIFIC OUTCOMES – HINDI

- PSO1.** हिंदी भाषा एवं साहित्य की आवश्यक समझ प्राप्ति
- PSO2.** हिंदी श्रवण , भाषण ,वाचन एवं लेखन कौशलों का विकास
- PSO3.** भाषा शिक्षण एवं भाषाई अस्मिता निर्माण में कारगर पाठ्यक्रम
- PSO4.** अध्येताओ में आंतरिक वैचारिक चिंतन की क्षमता निर्माण में महत्वपूर्ण भूमिका

COURSE OUTCOMES – HINDI

A. COURSE: HINDI ANCILLARY (PAPER I – FYBA – SEMESTER I & II)

- CO1.** हिंदी भाषाई विभिन्न साहित्य प्रकारों के ज्ञान के साथ अध्येताओं को हिंदी के विभिन्न क्षेत्रों में प्रवेश पाने हेतु सक्षम बनाया जाता है .
- CO2.** वैश्विक मानवीय जीवनमूल्यों के प्रति जागृत एवं प्रेरित किया जाता है .
- CO3.** हिंदी में प्रभावपूर्ण वैचारिक अभिव्यक्ति के काबिल बनाया जाता है .

B. COURSE: HINDI II & III (PAPER II & III – SYBA – SEMESTER III & IV)

- CO1.** हिंदी साहित्य की प्रतिनिधि पद्य और गद्य रचनाओं की शिक्षा द्वारा हिंदी दुनिया संबंधी अत्यावश्यक समझ प्रदान की जाती है .
- CO2.** अध्येताओं में प्रयोजनमूलक हिंदी सम्बंधित मौलिक चिंतन एवं आलोचनात्मक चर्चा का परिवेश निर्माण किया जाता है .
- CO3.** साहित्य और समाज के अंतःसम्बंध की समझ निर्माण की जाती है .
- CO4.** हिंदी सृजनशीलता हेतु आवश्यक सभी गतिविधियों का प्रभाव दृष्टिगोचर होता है आदि ...

PHILOSOPHY

PROGRAM SPECIFIC OUTCOMES – B.A. PHILOSOPHY

- PSO1.** To have a complete overview of Indian and Western Philosophy.
- PSO2.** To have a philosophical understanding of religion and ethics.
- PSO3.** To critically examine any data and be able to analyse and judge its validity.
- PSO4.** To understand, verify and express arguments.
- PSO5.** To be sensitive to various issues confronting Individual and Society.

COURSE OUTCOMES – B.A. PHILOSOPHY

A. COURSE: MORAL PHILOSOPHY (PAPER I – FYBA – SEMESTER I & II)

- CO1.** To provide a basic understanding of Philosophy in general and various fields in particular.
- CO2.** To inspire the student to confront the Moral dilemmas implicit in the experience of self, others and the universe.
- CO3.** To trace the growth of Ethics and Value systems both in Indian and Western domain.
- CO4.** To discuss morality in relation to contemporary issues both social and individual.
- CO5.** To provide open-ended solutions to moral dilemmas confronting the young generation.

B. COURSE: SOCIAL PHILOSOPHY (PAPER II – SYBA – SEMESTER III) AND POLITICAL PHILOSOPHY (PAPER II – SYBA – SEMESTER IV)

- CO1.** To acquaint students with basic philosophical questions and issues that are current in social philosophy.
- CO2.** To equip students with argumentative and analytical involved in philosophizing through these issues.
- CO3.** To encourage a spirit of rationality in philosophizing while appreciating and respecting differing philosophical ideas and perspectives.
- CO4.** To acquaint students with basic philosophical questions and issues that are current in political philosophy.
- CO5.** To equip students with argumentative and analytical involved in philosophical reasoning.

CO6. To encourage a spirit of rationality in philosophizing while appreciating and respecting differing philosophical ideas and perspectives.

C. COURSE: SCHOOLS OF INDIAN PHILOSOPHY (PAPER III – SYBA – SEMESTER III) AND GREEK AND MEDIEVAL PHILOSOPHY (PAPER III – SYBA – SEMESTER IV)

CO1. To acquaint students with basic philosophical questions that philosophers in India have addressed.

CO2. To equip students with argumentative and analytical involved in philosophical reasoning.

CO3. To encourage a spirit of rationality in philosophizing while appreciating and respecting differing philosophical systems and perspectives.

CO4. To acquaint students with basic philosophical questions that philosophers in the Greek and medieval tradition have addressed.

CO5. To equip students with argumentative and analytical involved in philosophical reasoning.

CO6. To encourage a spirit of rationality in philosophizing while appreciating and respecting differing philosophical systems and perspectives.

D. COURSE: COMPARATIVE RELIGIONS (APPLIED COMPONENT – SYBA – SEMESTER III & IV)

CO1. To arrive at an informed understanding of the diversity and complexity of World Religions.

CO2. To develop religious sensitivity necessary to understand the contemporary world.

CO3. Through this understanding lay the foundations for inner-faith dialogue, necessary for peace and harmony in the society.

E. COURSE: INDIAN PHILOSOPHY (ADVANCED) (PAPER IV– TYBA – SEMESTER V) AND WESTERN PHILOSOPHY (ADVANCED) (PAPER IV– TYBA – SEMESTER VI)

CO1. To understand the six systems of Indian philosophy.

CO2. To know the Astika and Nastika Darshanas.

CO3. To have an outline of Modern Western Philosophy.

CO4. To get introduced to Contemporary Indian and Western Philosophy.

F. COURSE: PHILOSOPHY OF RELIGION (PAPER V– TYBA – SEMESTER V & VI)

CO1. To understand the difference between Theology, Comparative Religion and Philosophy of Religion.

CO2. To critically evaluate the theories of Existence of God.

CO3. To understand Mysticism as the core of Religion.

CO4. To interpret religious languages.

CO5. To examine and answer the different questions and challenges faced by religion.

CO6. To critically examine the different approaches to religion.

G. COURSE: LIVING ETHICAL ISSUES (PAPER VI– TYBA – SEMESTER V & VI)

CO1. To know different religious attitudes towards the environment.

CO2. To know the difference between Deep and Shallow Ecology.

CO3. To understand the role of media and Media Ethics.

CO4. To critically examine current hotly debated Ethical Issues such as Abortion, Euthanasia, Suicide, Surrogacy, Cloning and so on.

H. COURSE: BHAGWAD GEETA (PAPER VII– TYBA – SEMESTER V & VI)

CO1. To achieve an understanding of the overall structure, purpose and content of Bhagwad Gita.

CO2. To explore and interpret philosophical ideas of Gita through reading of text.

CO3. To relate Gita's social, political and ethical ideas within a contemporary context.

CO4.

I. COURSE: FORMAL LOGIC (PAPER VIII– TYBA – SEMESTER V & VI)

CO1. To introduce students to Logic and Logical Reasoning.

CO2. To understand Traditional Deductive Logic.

- CO3. To know the role of Syllogism in framing an argument.
- CO4. To learn Venn diagrams for testing categorical propositions.
- CO5. To learn the Drawbacks of traditional Logic as against Modern Logic.
- CO6. To be able to find fallacies in a given argument.

J. COURSE: PHILOSOPHY OF YOGA (PAPER IX– TYBA – SEMESTER V & VI)

- CO1. To understand the Meaning of Yoga in different texts.
- CO2. To introduce to different kinds of Yoga.
- CO3. To understand the Yoga is Indian Psychology based on research and experience.
- CO4. Introduction and a complete overview of Patanjali Yoga Darshan.

POLITICAL SCIENCE

PROGRAM SPECIFIC OUTCOMES – B.A. POLITICAL SCIENCE

- PSO1.** Understand the structure and functioning of the Constitution of India.
- PSO2.** Understand and analyze the concepts and theories in Political Science
- PSO3.** Understand the theoretical aspects of Public Administration and structure and functioning of public administration in India
- PSO4.** Understand the evolution of the political process in Maharashtra. Analyze various political issues in Maharashtra.
- PSO5.** Understand Western and Indian political thought
- PSO6.** Understand various concepts, and issues in International Relations and India's role in International Relations
- PSO7.** Understand Rural and Urban local government system and its functioning in India
- PSO8.** Understand the structure and functioning of International and Regional Organizations
- PSO9.** Understand politics with the help of films, with reference to India

COURSE OUTCOMES – B.A. POLITICAL SCIENCE

A. COURSE: INDIAN POLITICAL SYSTEM (THE CONSTITUTIONAL FRAMEWORK) (PAPER I – FYBA – SEMESTER I)

- CO1.** Introduce the Constitution and certain basic technicalities to the learners.
- CO2.** Open the minds of our Constitution framers to the learners and to analyze the reasons which went into making our Constitution.
- CO3.** Understand the institutions and agencies that the State functions through.

B. COURSE: INDIAN POLITICAL SYSTEM (INDIAN POLITICAL PROCESS) (PAPER I – FYBA – SEMESTER II)

- CO1. Make learners conversant with the political and electoral process in India.
- CO2. Help learners secure a deep insight into significant variables in the system such as caste, religion, gender.
- CO3. Understand the challenges faced by the Indian political system and gain a sensitive comprehension to the contributing factors.

C. COURSE: POLITICAL THEORY (PRINCIPLES AND CONCEPTS OF POLITICAL THEORY) (PAPER II – SYBA – SEMESTER III)

- CO1. Make learners understand concepts intrinsic to the study of Politics.
- CO2. Study issues closely associated with the study and working of political systems.
- CO3. Have a solid theoretical understanding of the theories, concepts, principles and values that the learners would then be referring to in greater details in subsequent Semesters.

D. COURSE: POLITICAL THEORY (POLITICAL VALUES AND IDEOLOGIES) (PAPER II – SYBA – SEMESTER IV)

- CO1. Ensure a nuanced study of the Political Theory and make them relatable to contemporary issues.
- CO2. Equip student with an understanding of why political systems across the world take shape in certain ways over a period of time depending upon the choices they make and the effects they have.

E. COURSE: PUBLIC ADMINISTRATION (PUBLIC ADMINISTRATION) (PAPER III – SYBA – SEMESTER III)

- CO1. Set the tone towards learning administration.
- CO2. Understand newer developments in the field of Public Administration.
- CO3. Create informed students of issues of administrative concern.

F. COURSE: PUBLIC ADMINISTRATION (INDIAN ADMINISTRATION) (PAPER III – SYBA – SEMESTER IV)

- CO1. Have an incisive view of administration in India and its changing nature.
- CO2. Learn the nuances of personnel administration in India.
- CO3. Get acquainted with the budgetary and financial processes.

G. COURSE: POLITICAL PROCESS IN MODERN MAHARASHTRA (POLITICS OF MODERN MAHARASHTRA) (PAPER IV – TYBA – SEMESTER V)

- CO1. Acquaint students with the political backdrop in the State as a basis for further studies.
- CO2. Study the regional disparities and the peoples' movements in the State.
- CO3. Understand objectively the politics working on emotive issues.

H. COURSE: POLITICAL PROCESS IN MODERN MAHARASHTRA (DETERMINANTS OF POLITICS OF MAHARASHTRA) (PAPER IV – TYBA – SEMESTER VI)

- CO1. Acquaint the learner with the emerging trends in a progressive state of Maharashtra and how the political economy of the region has defined it.
- CO2. Recognize and analyze the present political scenario in the State.

I. COURSE: POLITICAL THOUGHT (WESTERN POLITICAL THOUGHT) (PAPER V – TYBA – SEMESTER V)

- CO1. Acquaint the learners with theoretical understanding of political concepts.
- CO2. Understand existing, contemporary and emerging trends in Politics with reference to how thinkers viewed them in the context of their times.

J. COURSE: POLITICAL THOUGHT (INDIAN POLITICAL THOUGHT) (PAPER V – TYBA – SEMESTER VI)

- CO1. Make learners aware of the various strands of thoughts with Indian perspective.
- CO2. Recognize and analyze the relevance and applicability of these thought processes to the present times.

K. COURSE: INTERNATIONAL RELATIONS (WORLD POLITICS) (PAPER VI – TYBA – SEMESTER V)

- CO1. Acquaint the students with the recent developments across the world and their impact.
- CO2. Study the developments in the global scenario through new decisions & policies.

L. COURSE: INTERNATIONAL RELATIONS (INDIA IN WORLD POLITICS) (PAPER VI – TYBA – SEMESTER VI)

- CO1. Analyze India's standing in the international community.
- CO2. Help learners understand the contexts and developments and to take a clinical view towards the relations in the Indian sub-continent.

M. COURSE: LOCAL SELF GOVERNMENT WITH SPECIAL REFERENCE TO MAHARASHTRA (RURAL LOCAL SELF GOVERNMENT) (PAPER VII – TYBA – SEMESTER V)

- CO1. Learn how democratic decentralization is significant in deepening democracy.
- CO2. Prepare learners to understand contemporary issues in local governance.
- CO3. Have an empathetic understanding of the undercurrents in grassroots administration.

N. COURSE: LOCAL SELF GOVERNMENT WITH SPECIAL REFERENCE TO MAHARASHTRA (URBAN LOCAL SELF GOVERNMENT) (PAPER VII – TYBA – SEMESTER VI)

- CO1.** Study the requirements and working of urban local bodies with specific reference to the State of Maharashtra.
- CO2.** Look into serious urban issues with empathy and academic concern to find alternatives and solutions.

O. COURSE: INTERNATIONAL AND REGIONAL ORGANISATIONS (INTERNATIONAL ORGANISATIONS) (PAPER VIII – TYBA – SEMESTER V)

- CO1.** Enhance learners' knowledge towards International Relations and make them more perceptive towards the role of International Organizations.
- CO2.** Have a greater understanding of how far the repercussions of the decisions taken by international organizations resonate in IR.

P. COURSE: INTERNATIONAL AND REGIONAL ORGANISATIONS (REGIONAL ORGANISATIONS) (PAPER VIII – TYBA – SEMESTER VI)

- CO1.** Enhance learners' knowledge in Regional Organizations which are increasingly gaining importance.
- CO2.** Analyze the recent and contemporary developments that these organizations are involved in.

Q. COURSE: UNDERSTANDING POLITICS THROUGH FILMS (POLITICS AND FILMS) PAPER IX – TYBA – SEMESTER V)

- CO1. Juxtapose understanding of politics through something that is commonly looked at as entertainment but is, in fact, a very powerful tool of communication.
- CO2. Discuss serious socio-political and contemporary issues through a treasure trove of knowledge covered by films, documentaries and regional cinema.

R. COURSE: UNDERSTANDING POLITICS THROUGH FILMS (LEARNING INDIAN POLITICS THROUGH FILMS) (PAPER IX – TYBA – SEMESTER VI)

- CO1. Make learners aware of an era they usually do not study in such an unconventional manner
- CO2. Deliberate and dwell on topics which may have been theoretically studied earlier but get covered intensely through the visual medium.

PSYCHOLOGY

PROGRAM SPECIFIC OUTCOMES – B.A. PSYCHOLOGY

The B.A. Psychology Program aims at fostering ethics-based knowledge and skill development in learners. The principal function of the Department of Psychology, Mithibai College of Arts (Autonomous), is to prepare learners at the undergraduate and post-graduate levels to pursue careers within the discipline and affiliated areas. Bolstering the robust curriculum is the provision of quality instructions by faculty members, who inspire learners to be sensitive to cultural issues and individual differences, facilitate personal growth and connect scientific theory to practice.

The Program Specific Outcomes (PSOs) for B.A. Psychology are based on the *APA Guidelines for the Undergraduate Psychology Major* (2013).

At the end of a B.A. Psychology program, learners would be able to:

- PSO1.** Develop a knowledge base in Psychology – Understand the key concepts, principles and overarching themes in the study of Psychology; develop a working knowledge of psychology's content domains; recognize, understand, compare and apply the core domains of Psychology to everyday and professional life; identify plausible psychosocial and biological principles that influence human behaviour, cognition and affect; and articulate ethical issues in Psychology with reference to culture-specific societies.
- PSO2.** Develop scientific inquiry and critical thinking skills – use the scientific method as a primary basis for engaging in critical thinking and demonstrate Psychology information literacy; use scientific reasoning to interpret psychological phenomena; engage in integrative thinking and problem solving; review empirical studies of Psychology to further analyse and synthesize their research findings to draw appropriate inferences; interpret, design and conduct basic psychological research.

- PSO3.** Understand ethical and social responsibilities in a diverse world – recognize and respect the complexity of sociocultural diversity and individual differences; describe the impact of society and culture on human diversity and individual differences; apply ethical standards to evaluate and interpret psychological science and practice as well as adopt ethical values that help build a kinder community.
- PSO4.** Develop basic personal and professional skills – explore and understand own personality; interact effectively and work productively with others; enhance personal stress management and coping skills; apply psychological content and skills to their professional goals and develop meaningful professional direction for the future.
- PSO5.** Develop professional communication skills – interpret and write reports using the APA style; appropriately use technical language in oral and written communication; use appropriate computer technology to complete assignments and exhibit presentation skills.

COURSE OUTCOMES – B.A. PSYCHOLOGY

A. COURSE: INTRODUCTION TO PSYCHOLOGY (PAPER I – FYBA – SEMESTER I & II)

- CO1.** Identify the roots of psychology as a science, the different schools of psychology and discuss the development of psychology in India.
- CO2.** Understand and differentiate between the different fields and perspectives of psychology as a science.
- CO3.** Understand the use of the scientific method to describe psychological phenomena with emphasis on ethical practices in psychological research.
- CO4.** Elucidate the functions and applications of basic descriptive and inferential statistics used in psychological investigations.
- CO5.** Help the learner become aware of the role of biology, the neural system and endocrine glands in the understanding of human behaviour and the various brain structures and functions relevant in understanding psychological phenomena.

- CO6.** Understand theories of learning, including the conditioning theories, cognitive and observational learning theories and their applications to everyday life and the professional practice of psychology.
- CO7.** Create awareness about the Information Processing Model of memory, applications of memory theories to everyday life and the neuroscience of memory
- CO8.** Help the learner understand human memory in terms of the nature of every memory system, the process of retrieval from long term memory and the nature and reasons of forgetting.
- CO9.** Understand the meaning, nature and various Theories of Intelligence.
- CO10.** Help the learner understand the process of test construction and intellectual differences.
- CO11.** Understand the meaning, structure and development of language in humans and the relationship between thought and language.
- CO12.** Examine the various approaches to understand motivation, with emphasis on the nature of hunger as a motivation.
- CO13.** Understand the meaning, nature and theories of human emotions, with emphasis on the role of culture on emotions.
- CO14.** Understand the applications of motivation and emotion theories to everyday life and in the professional practice of psychology.
- CO15.** Develop an understanding of the meaning of personality, the various perspectives/theories of personality, the relationship between culture, genetics and personality development and the various personality assessment methods with applications in everyday life.
- CO16.** Help the learner trace the history of the development of positive psychology (with emphasis on the development of the classification systems) and the applications of positive psychology in everyday life.
- CO17.** Understand the principles of pleasure i.e. the role of positive emotions, nature and theories of happiness and subjective well-being.
- CO18.** Understand the meaning, nature, theories, antecedents, correlates and applications of self-efficacy, optimism, hope, altruism, gratitude and forgiveness.

B. COURSE: SOCIAL PSYCHOLOGY (PAPER II – SYBA – SEMESTER III & IV)

- CO1.** Make the learner aware of the meaning, nature and scope of social psychology and the various influences on human behaviour including personal dispositions, belief systems, biology, evolution, cognition and situations.
- CO2.** Understand the various research designs employed in the understanding of social behaviour
- CO3.** Understand the development of the social self, self-knowledge and relationship between self and culture.
- CO4.** Understand the development and nature of self-esteem.
- CO5.** Understand the various concepts and theories of self-control: self-efficacy, locus of control, learned helplessness and self-determination.
- CO6.** Help the learner understand the concepts of self-serving bias and self-presentation.
- CO7.** Help the learner understand the formation of attitudes, the relationship between attitudes and behaviour and the phenomena of persuasion and cognitive dissonance.
- CO8.** Make the learner aware of the nature and origin of stereotypes, prejudice and discrimination and the techniques to counter prejudice.
- CO9.** Examine the meaning, nature, studies and real-world applications of the research on conformity, compliance and obedience.
- CO10.** Examine prosocial behaviour, the bystander's effect and factors influencing helping behaviour.
- CO11.** Examine the various perspectives on aggression, the relation between emotions and aggression and how aggression can be controlled.
- CO12.** Understand the meaning and nature of groups and the phenomena of social facilitation, social loafing, deindividuation, group polarization and group think.

C. COURSE: HUMAN DEVELOPMENT (PAPER III – SYBA – SEMESTER III & IV)

- CO1.** Elucidate the nature, scope, key issues, theoretical perspectives and research methods in the study of lifespan development.
- CO2.** Understand the role of genes and chromosomes and the interaction between hereditary and environment in early development.
- CO3.** Elucidate the process and changes in prenatal growth.
- CO4.** Understand the process of birth, birth complications and characteristics of a new born.
- CO5.** Make the learner aware of the physical, cognitive and social development of an infant.
- CO6.** Make the learner aware of preschool children with respect to their physical, cognitive, language, social and personality development, relationships and aggression and violence.
- CO7.** Help the learner understand the physical, intellectual, social and personality development processes during the middle childhood years.
- CO8.** Understand the processes of physical maturation, cognitive, social and personality development in adolescents.
- CO9.** Understand the threats to adolescents' well-being.
- CO10.** Understand the physical, social and career development during early adulthood years.
- CO11.** Make the learner aware of the physical development, changes in health, personality development, changes in social relationships and patterns of work and leisure during middle adulthood period.
- CO12.** Understand the physical and cognitive development, changes in health and wellness, the daily life and changes in relationships during late adulthood (old age).
- CO13.** Create awareness about the various perspectives on death and dying across the lifespan and the theories and process of confronting death, grieving and bereavement.

D. COURSE: STRESS MANAGEMENT (APPLIED COMPONENT – SYBA – SEMESTER III & IV)

- CO1.** Trace the earliest contributions in the study of stress and stress response in humans.
- CO2.** Become aware of the major theories and components of stress in detail.

- CO3.** Understand the role and functions of the brain, endocrine system, nervous system, cardiovascular system, gastrointestinal system, muscles and skin during a stress reaction.
- CO4.** Examine the concept of hot reactors and psychosomatic illness.
- CO5.** Help the learner understand the link between stress and the immune system, cholesterol, specific physiological conditions (such as cardiovascular disease, ulcers, cancer, arthritis, etc.), and post-traumatic stress disorder.
- CO6.** Understand the stress model and setting up of roadblocks in a stress model.
- CO7.** Examine the comprehensive stress model and eustress and the stress model.
- CO8.** Examine the intrapersonal, interpersonal and perceptual interventions one can employ to cope with stress and the role of personality, locus of control, self-esteem, anxiety management, resilience and hardiness in stress management.
- CO9.** Help the learner understand the meaning, procedures and benefits of relaxation techniques such as meditation, autogenic training, biofeedback and other techniques.
- CO10.** Help the learner understand the role of exercise and physical fitness in coping with stress and strategies to decrease stressful behaviours.
- CO11.** Help the learner understand the meaning, theories and correlates of occupational stress.
- CO12.** Understand occupational stressors, workaholism and burnout and interventions to cope with occupational stressors.
- CO13.** Understand the changing trends in family structures that are a cause of stress, family stressors, the family stress model and interventions to cope with family stressors.

E. COURSE: PSYCHOLOGICAL TESTING & STATISTICS (PAPER IV – TYBA– SEMESTER V & VI)

- CO1.** Help the learner understand the uses and varieties of psychological tests and reasons for controlling their use
- CO2.** Help the learner understand the methods, procedures of and factors influencing test administration and the effects of training on test performance.
- CO3.** Examine the theory of reliability, types of reliability, the reliability of speed tests, the dependence of reliability coefficients on the sample tested and the standard error of measurement.

- CO4.** Examine the evolving concept, types and procedures of test validity.
- CO5.** Examine the various components and procedures of item analysis – item difficulty, item discrimination, item bias, cross validation, differential item functioning and the exploration in item deviation.
- CO6.** Understand the different types of scores and scales of measurement, procedures in preparing a frequency distribution and various graphical representations.
- CO7.** Understand measures of central tendency - their calculation, merits, limitations and uses.
- CO8.** Understand the various individual ability tests and projective tests and the applications of psychological testing in different contexts.
- CO9.** Help the learner understand the laws of probability, the importance and applications of the Normal Probability Curve, and the various forms, causes and formulae for calculating skewness.
- CO10.** Help the learner understand the various standard scores (z, t, stanine) and the procedure of linear and non-linear transformation.
- CO11.** Understand the calculation of the measures of variability – range, average deviation, quartile deviation and standard deviation.
- CO12.** Help the learner understand the nature, merits, limitations, uses and calculation of percentiles and percentile ranks.
- CO13.** Help the learner understand the meaning, types and steps involved in calculation of correlations and simple and multiple regressions.

F. COURSE: ABNORMAL PSYCHOLOGY (PAPER V – TYBA – SEMESTER V & VI)

- CO1.** Understand mental disorders, the history of psychopathology and the various theoretical perspectives in abnormal psychology.
- CO2.** Help the learner understand the use, development, changes in the DSM and describe the use of personality tests and neuropsychological assessments.
- CO3.** Understand the clinical description of anxiety disorders and describe the role of gender, sociocultural factors, common risk factors, etiology and treatment of anxiety disorders.

- CO4.** Understand dissociative disorders, somatoform disorders and disorders of childhood and late life (ADHD, Autism, Learning disabilities, mental retardation, dementia and depression)
- CO5.** Examine the clinical description, etiology and treatment of schizophrenia and mood disorders
- CO6.** Examine the concepts of sexual and gender dysphoria – sexual norms and behaviour, gender dysphoria, paraphilias and rape.
- CO7.** Understand personality disorders – their classification, clusters and treatment

G. COURSE: INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY (PAPER VI – TYBA – SEMESTER V & VI)

- CO1.** Help the learner understand organizational behaviour, the disciplines that contribute to the field of organizational behaviour and the challenges and opportunities of this field.
- CO2.** Make the learner aware of the importance of interpersonal skills.
- CO3.** Understand the functions, roles and skills of managers.
- CO4.** Help the learner understand the main components of attitudes and identify the major job attitudes.
- CO5.** Understand job satisfaction, its measurement, causes and impact at the workplace.
- CO6.** Make the learner aware of motivation - Early and contemporary theories of motivation.
- CO7.** Understand leadership - the Trait and Behaviour Theories of Leadership, Contingency Theories of Leadership, Leader-Member Exchange Theory.
- CO8.** Help the learner understand the key characteristics and dark side of the charismatic leadership and the characteristics of transactional and transformational leaders.
- CO9.** Help the learner understand the differences between groups and teams, the different types of teams and the procedure to create effective teams
- CO10.** Define conflicts and discuss the transitions in conflict thoughts. Help the learner understand the conflict process in detail.
- CO11.** Help the learner understand the meaning and process of negotiation along with bargaining strategies.

CO12. Help the learner understand the functions, process and direction of communication, the barriers to effective communication and the global implications for managers.

CO13. Examine interpersonal and organizational communication.

CO14. Examine the various communication channels and role of persuasive communications.

CO15. Help the learner understand the forces of change in organizations, work stress and it's management.

H. COURSE: COGNITIVE PSYCHOLOGY (PAPER VII – TYBA – SEMESTER V & VI)

CO1. Present an interdisciplinary approach to cognition

CO2. Understand the various theories of perception and deficits in perception.

CO3. Make the learner aware of the concepts of selective and divided attention and controlled and automatic attention and understand when human attention fails.

CO4. Understand the models of memory in detail, the constructive nature and distortions of the human memory.

CO5. Understand declarative and non-declarative knowledge, concepts and categorization.

CO6. Help the learner understand the various types, approaches and blocks to problem-solving.

CO7. Understand the nature of imagery in detail, the principles and process of mental rotation and scanning.

CO8. Make the learner aware of the various individual differences in cognition – skills, abilities, cognitive styles, learning styles, age, culture and gender differences.

I. COURSE: PRACTICALS IN COGNITIVE PROCESSES AND PSYCHOLOGICAL TESTING (PAPER VIII – TYBA – SEMESTER V & VI)

CO1. Make the learner aware of the various experimental designs, methodology and conduction of psychological experiments.

CO2. Understand the various statistical analysis that can be employed to interpret and discuss results.

CO3. Help the learner design a psychological experiment.

- CO4.** Understand the differences between manual and cog-lab based experiments.
- CO5.** Understand the APA format for writing research articles.
- CO6.** Administer psychological tests in an ethical manner
- CO7.** Conduct experiments in the laboratory and analyse and discuss the results of the same.

J. COURSE: COUNSELLING PSYCHOLOGY (PAPER IX – TYBA – SEMESTER V & VI)

- CO1.** Differentiate between the basic terminologies related to counselling. Understand the personality and background of a counsellor and explain the three levels of helping.
- CO2.** Help the learner understand the attribution and systematic framework of counsellors.
- CO3.** Examine how counsellors can engage in counselling-related activities.
- CO4.** Create awareness about ethics, morality and law. Understand the importance and various ethical codes governing the practice of counselling, the process of making ethical decisions, how counsellors can be educated in ethical decision making and the role of ethics in specific counselling situations.
- CO5.** Create awareness about multiple relationships and working with unethical counsellors.
- CO6.** Make the learner aware of the Mental Health Care Act (2017) and the POCSO Act (2012) in brief.
- CO7.** Understand the six factors that influence the counselling process.
- CO8.** Help the learner understand the types and conduction of initial interviews.
- CO9.** Make the learner aware of the role of exploring and identifying goals in the building stage of counselling, the various counselling skills during the working stage of counselling, and the importance, timing and issues of closing counselling sessions and relationship.
- CO10.** Help understand the concepts of transference and counter-transference
- CO11.** Understand resistance to closing and premature closing. Differentiate between the processes of counsellor-initiated and client-initiated closing.
- CO12.** Help the learner understand culture and multiculturalism and the history, difficulties and issues in multicultural counselling.

- CO13.** Understand the needs and counselling strategies for the aged population, men and women, individuals with different gender orientations and individuals practicing spirituality.
- CO14.** What is a theory? Understand the importance of a theory and a theory in practice.
- CO15.** Help the learner understand the Psychoanalytic, Adlerian, Humanistic, Behaviour Theory, Cognitive and Cognitive-Behavioural Theories of counselling.
- CO16.** Understand the Systems Theory, Brief Counselling Approaches, Crisis and Trauma Counselling Approaches.
- CO17.** Trace a brief history of group counselling and understand the misperceptions and realities about group counselling.
- CO18.** Understand the place of groups in counselling, the benefits, drawbacks and types of group counselling.
- CO19.** Understand the theoretical approaches in conducting group counselling.
- CO20.** Understand the stages and issues in group counselling and also throw light on the qualities of effective group leaders.
- CO21.** Create awareness of the current trends in counselling – dealing with violence, trauma and crisis, promoting wellness, concern for social justice & advocacy, use of technology.

K. COURSE: PSYCHOLOGY OF HUMAN BEHAVIOUR AT WORK (ABILITY ENHANCEMENT COURSE) – T.Y.B.COM – SEMESTER V & VI

- CO1.** Help the learner understand organizational behaviour, the disciplines that contribute to the field of organizational behaviour and the challenges and opportunities of this field.
- CO2.** Make the learner aware of the importance of interpersonal skills.
- CO3.** Understand the functions, roles and skills of managers.
- CO4.** Help the learner understand the main components of attitudes and identify the major job attitudes.
- CO5.** Understand job satisfaction, it's measurement, causes and impact at the workplace.
- CO6.** Make the learner aware of motivation - Early and contemporary theories of motivation.
- CO7.** Understand leadership - the Trait and Behaviour Theories of Leadership, Contingency Theories of Leadership, Leader-Member Exchange Theory.

- CO8.** Help the learner understand the key characteristics and dark side of the charismatic leadership and the characteristics of transactional and transformational leaders.
- CO9.** Help the learner understand the differences between groups and teams, the different types of teams and the procedure to create effective teams
- CO10.** Define conflicts and discuss the transitions in conflict thoughts. Help the learner understand the conflict process in detail.
- CO11.** Help the learner understand the meaning and process of negotiation along with bargaining strategies.
- CO12.** Help the learner understand the functions, process and direction of communication, the barriers to effective communication and the global implications for managers.
- CO13.** Examine interpersonal and organizational communication.
- CO14.** Examine the various communication channels and role of persuasive communications.
- CO15.** Help the learner understand the forces of change in organizations, work stress and it's management.

SOCIOLOGY

PROGRAM SPECIFIC OUTCOMES – B.A. SOCIOLOGY

Sociology is one of the most sought after and fundamental social science under humanities. There is an ever-growing demand for this subject, not only in Arts courses, but also extends to liberal arts, nursing and pharmacy, law and media, HRM and entrepreneurial courses.

PSO1. To introduce the fundamentals of the subject and provide conceptual clarity.

PSO2. To address contemporary issues studied and debated upon by sociologists around the world.

PSO3. To serve a dual purpose – strengthen the foundation in the subject as well as generate awareness about the various social aspects of our society.

COURSE OUTCOMES – B.A. SOCIOLOGY

A. COURSE: FOUNDATIONS OF SOCIOLOGY (PAPER I – FYBA – SEMESTER I) AND FUNDAMENTALS OF SOCIOLOGY (PAPER I – FYBA – SEMESTER II)

CO1. To provide the students of sociology with basic understanding of concepts, processes and changes in structures and institutions in society.

CO2. sensitize the students towards the problems and challenges faced by the different sections of society.

CO3. To gain a deeper and coherent understanding of sociology with an updated knowledge of career opportunities in the subject.

CO4. To familiarize the students with contemporary trends in the study of sociology.

CO5. Analyse factors contributing towards bringing about changes in various social structures and institutions.

CO6. Comprehend the challenges and issues faced by different sections in the society.

B. COURSE: INDIAN SOCIETY: STRUCTURE AND CHANGE (PAPER II – SYBA – SEMESTER III) AND SOCIOLOGY OF DEVELOPMENT (PAPER II – SYBA – SEMESTER IV)

- CO1.** To introduce students to the various sociological traditions with selected readings in Indian Sociology as well as acquaint students with emerging issues in Indian Society.
- CO2.** To Understand basics and theoretical framework of Indian Sociology
- CO3.** Getting students accustomed with the contemporary social challenges and debates in Indian Social Milieu
- CO4.** To introduce various theoretical perspectives in Indian society that has shaped the concept of development.
- CO5.** To help students to gain an insight into emerging issues and contemporary debates within the development discourse.
- CO6.** To familiarise students with basics of social research methods

C. COURSE: CONTEMPORARY ISSUES IN INDIAN SOCIETY (PAPER III – SYBA – SEMESTER III) AND EMERGING FIELDS IN SOCIOLOGY (PAPER III – SYBA – SEMESTER IV)

- CO1.** To bring awareness and sensitivity among the students towards contemporary issues.
- CO2.** Students would be acquainted with the significant debates in the field of Sociology
- CO3.** To introduce students to the relevance and varied possibilities for future studies in sociology.
- CO4.** It makes students aware about the new vibrant fields in sociology.
- CO5.** To provide students with an in-depth understanding of struggle and survival in today's competitive scenario.

**D. COURSE: INTRODUCTION TO SOCIAL WORK AND SOCIAL WELFARE
(APPLIED COMPONENT– SYBA – SEMESTER III & IV)**

- CO1. To introduce students to the basic concepts of social work and in the Indian context.
- CO2. To acquaint students to the concept of development and apply critical thinking to them about the existing dilemmas, issues and problems in development of India.
- CO3. To motivate students and pave way for them to enrol for masters in social work and to volunteer for social cause
- CO4. To make learner aware of the context of sociology and social welfare.
- CO5. To acquaint students to the changes in the field of social welfare.
- CO6. To familiarize & sensitize students with the varied problems faced by marginalised groups.

E. COURSE: SOCIAL THEORY (PAPER IV – TYBA – SEMESTER V)

- CO1. To provide the students of Sociology with the understanding of Sociological Theory.
- CO2. To train students in the application of these theories to social situations.

F. COURSE: SOCIOLOGY OF WORK (PAPER V – TYBA – SEMESTER V)

- CO1. To introduce students to the area of industrial sociology
- CO2. To familiarise students to the nature of Indian work and workers
- CO3. To develop sociological understanding of the changes taking place in the area of work

G. COURSE: SOCIOLOGY OF GENDER (PAPER VI – TYBA – SEMESTER V)

- CO1. To trace the evolution of Gender as a category of social analysis.
- CO2. To familiarize students with concepts associated with gender studies.
- CO3. Tracing the historical evolution feminist movements, its goals and ideologies.
- CO4. To sensitise the students on gender issues.

H. COURSE: HUMAN RESOURCE DEVELOPMENT (PAPER VII – TYBA – SEMESTER V)

- CO1. To familiarize the students with role and functions of human resource development at the micro and macro level.
- CO2. To create an awareness of the various issues involved in the development of human resources with particular emphasis on social and cultural factors.

I. COURSE: ENVIRONMENT AND SOCIETY (PAPER VIII – TYBA – SEMESTER V)

- CO1. To acquaint learners with basic theoretical concepts in Environmental Sociology
- CO2. To orient learners with the debate between ecology and development and problems arising from haphazard models of development.
- CO3. To make them understand the stark differences between environmental issues of rural and urban areas.

J. COURSE: QUANTITATIVE SOCIAL RESEARCH (PAPER IX – TYBA – SEMESTER V)

- CO1. To provide students with an orientation to Quantitative Social Research.
- CO2. To acquaint students with the important concepts, techniques and processes in quantitative research.
- CO3. To guide students to work on meaningful, minor research projects.

K. COURSE: ANTHROPOLOGY - EMERGENCE AND PERSPECTIVES (PAPER IV – TYBA – SEMESTER VI)

- CO1. To provide the student with the understanding of different branches and dominant perspectives of Anthropology.
- CO2. To train students in the application of these perspectives to social situations.

L. COURSE: SOCIOLOGY OF INFORMAL SECTOR (PAPER V – TYBA – SEMESTER VI)

- CO1. To develop a sociological understanding of the issues related to the informal sector.
- CO2. To introduce students to the growing sector of informal workers in the Indian economy

M. COURSE: GENDER AND SOCIETY IN INDIA: EMERGING ISSUES (PAPER VI – TYBA – SEMESTER VI)

- CO1. To understand new and emerging issues in the Indian women's status and movement.
- CO2. Expand student's understanding of sexuality and the current movements pertaining to the same.
- CO3. To understand newer and contemporary methods of protest and resistance.

N. COURSE: SOCIOLOGY OF ORGANIZATION (PAPER VII – TYBA – SEMESTER VI)

- CO1. To familiarize students with dynamics of organizations and diverse strategies useful in developing human resources.
- CO2. To create an understanding of human resource planning to social development and comprehend the challenges faced by organizations in a global context.

O. COURSE: ENVIRONMENTAL CONCERNS IN INDIA (PAPER VIII – TYBA – SEMESTER VI)

- CO1. To acquaint learners with basic theoretical concepts in Environmental Sociology.
- CO2. To orient them with the debate between ecology and development and problems arising from haphazard models of development.
- CO3. To make them understand the stark differences between environmental issues of rural and urban areas.

P. COURSE: QUALITATIVE SOCIAL RESEARCH (PAPER IX – TYBA – SEMESTER VI)

- CO1.** To provide students with an orientation to Qualitative Social Research.
- CO2.** To acquaint students with the important concepts, techniques and processes in quantitative Research.
- CO3.** To teach them gender neutral ways of doing research.
- CO4.** To guide students to work on meaningful, minor research projects.

COMPULSORY COURSES

PROGRAM SPECIFIC OUTCOMES

AND

COURSE OBJECTIVES

FOUNDATION COURSE

PROGRAM SPECIFIC OUTCOMES – FOUNDATION COURSE

- PSO1.** To develop a preliminary understanding of significant changes and factors that have influenced the cultural, economic, environmental and political fabric of Indian society
- PSO2.** To develop a well-balanced standpoint for many of the pressing social problems seen in Indian society
- PSO3.** To develop basic understanding about issues related to Human Rights of weaker sections, ecology and science of technology.
- PSO4.** To gain an overview of significant skills required to address competition in career choices.
- PSO5.** To appreciate the importance of developing a scientific temper towards technology and its use in everyday life.

COURSE OUTCOMES – FOUNDATION COURSE

A. COURSE: FOUNDATION COURSE (FYBA/FYBSc/FYBCom – SEMESTER I)

- CO1.** To understand the pluralistic nature of Indian society
- CO2.** To sensitise about the gender disparity in society.
- CO3.** To understand diversity as difference and disparity as inequality.
- CO4.** To understand the philosophy and structure of the Constitution of India and government bodies working at different levels of government administration
- CO5.** To create awareness about growing social problems in India

B. COURSE: FOUNDATION COURSE (FYBA/FYBSc/FYBCom – SEMESTER II)

- CO1.** To understand the impact of globalisation on Indian society
- CO2.** To introduce the concept of Human Rights and fundamental rights

- CO3.** To understand the importance of environment and sustainable development
- CO4.** To recognize factors that cause stress and conflict in present times
- CO5.** Awareness of social problems of Indian society: its challenges and remedies

C. COURSE: FOUNDATION COURSE (SYBA/SYBSc/SYBCom – SEMESTER III & IV)

- CO1.** To acquaint a student with Human Right Provisions, Violations and Redressal Mechanisms.
- CO2.** To sensitise students to environmental concerns.
- CO3.** To develop Scientific Thinking and Temper.
- CO4.** To develop soft skills for Effective Interpersonal Communication.
- CO5.** To provide a brief overview of different Competitive Examinations.

COMMUNICATION SKILLS

PROGRAM SPECIFIC OUTCOMES – COMMUNICATION SKILLS

- PSO1.** Familiarize the learner with the functional aspects of English language.
- PSO2.** Understand of the potency of effective communication in the professional world
- PSO3.** Use a range of lexical resource for better communication
- PSO4.** Develop the ability to communicate in English in the four primary skills of reading, writing, listening and speaking
- PSO5.** Gain language proficiency through adequate exposure to reading and writing skills

COURSE OUTCOMES – COMMUNICATION SKILLS

A. COURSE: COMMUNICATION SKILLS (FYBA– SEMESTER I & II)

- CO1.** To use effective business communication skills to meet the challenges of the professional world and achieve success in his/her professional goals and contribute to the growth of the organization he/she is employed with.

BUSINESS COMMUNICATION

PROGRAM SPECIFIC OUTCOMES – BUSINESS COMMUNICATION

- PSO1.** Familiarize the learner with the processes and channels of communication which links an organization with its internal and external world
- PSO2.** Understand the potency of effective communication in the professional world
- PSO3.** Define business ethics that organizations must comply with in business world
- PSO4.** Acquaint with the rapidly changing communication technology
- PSO5.** Express with lucidity and clarity while writing business correspondences and speaking in interpersonal or group communication situations

COURSE OUTCOMES – BUSINESS COMMUNICATION

A. COURSE: BUSINESS COMMUNICATION (FYBCom– SEMESTER I & II)

- CO1.** To use effective business communication skills to meet the challenges of the professional world and achieve success in his/her professional goals and contribute to the growth of the organization he/she is employed with.

FRENCH COMPULSORY

PROGRAM SPECIFIC OUTCOMES – FRENCH COMPULSORY

- PSO1.** Familiarize with the functional aspects of the language
- PSO2.** Equip with the range of lexical resources required for communication
- PSO3.** Able to demonstrate mastery over French in the four primary skills of reading, writing, listening and speaking.
- PSO4.** Meet the challenges of communicating in French in the professional world and achieve success in his/her inter-personal and group communication

COURSE OUTCOMES – FRENCH COMPULSORY

A. COURSE: FRENCH COMPULSORY (FYBA– SEMESTER I & II)

- CO1.** The learner will be familiar with the functional aspects of the language.
- CO2.** The learner will be equipped with a range of lexical resources necessary for communication in French.
- CO3.** The learner will have developed ability to communicate fluently in the French in the four primary skills of writing, listening, speaking and reading.
- CO4.** The learner will have enhanced language proficiency due to exposure to variety of stimulating exercises in reading, writing, listening and speaking.

GUJARATI COMPULSORY

PROGRAM SPECIFIC OUTCOMES – GUJARATI COMPULSORY

(INTRODUCTION TO GUJARATI LITERATURE - I & II)

PSO1. Understand the behaviour, nature of language and importance of the Gujarati Literature.

COURSE OUTCOMES – GUJARATI COMPULSORY (INTRODUCTION TO GUJARATI LITERATURE – I & II)

A. COURSE: INTRODUCTION TO GUJARATI LITERATURE – I & II (PAPER I– FYBA – SEMESTER I & II)

- CO1.** To provide a basic understanding of Gujarati in general and various fields in particular.
- CO2.** To inspire the student to confront the Moral dilemmas implicit in the experience of self, others and the universe.
- CO3.** To express themselves effectively in a variety of forms.
- CO4.** To provide open-ended solutions to moral dilemmas confronting the young generation.

HINDI COMPULSORY

PROGRAM SPECIFIC OUTCOMES – HINDI COMPULSORY

- PSO1.** हिंदी भाषा एवं साहित्य की आवश्यक समझ प्राप्ति
- PSO2.** हिंदी श्रवण , भाषण ,वाचन एवं लेखन कौशलों का विकास
- PSO3.** भाषा शिक्षण एवं भाषाई अस्मिता निर्माण में कारगर पाठ्यक्रम
- PSO4.** अध्येताओ में आंतरिक वैचारिक चिंतन की क्षमता निर्माण में महत्वपूर्ण भूमिका

COURSE OUTCOMES – HINDI COMPULSORY

C. COURSE: HINDI COMPULSORY (FYBA– SEMESTER I & II)

- CO1.** हिंदी भाषाई विभिन्न साहित्य प्रकारों के ज्ञान के साथ अध्येताओं को हिंदी के विभिन्न क्षेत्रों में प्रवेश पाने हेतु सक्षम बनाया जाता है .
- CO2.** वैश्विक मानवीय जीवनमूल्यों के प्रति जागृत एवं प्रेरित किया जाता है .
- CO3.** हिंदी में प्रभावपूर्ण वैचारिक अभिव्यक्ति के काबिल बनाया जाता है .

B. Sc. in Botany
F.Y.B.Sc.

Programme Specific Outcomes PSO: Three year Degree course.

Students will learn the fundamental basics of plant sciences and the recent developments in various branches of Botany like Algae, Fungi, Bryophyta, Pteridophyta, Gymnosperms, Angiosperms, Genetics, Molecular Biology, Anatomy, Physiology, Biotechnology with an objective to raise the students awareness in interdisciplinary courses such as Biostatistics, Bioinformatics, instrumentation, Palynology, Embryology, Medicinal Botany & Cosmetology.

First Year is Botany in combination with Chemistry and Zoology or with Physics, and Chemistry or with Chemistry and Microbiology.

SEMESTER I

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
USMABO101	PLANT BIODIVERSITY I	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	Algae	<ul style="list-style-type: none"> • It develops knowledge of the basic concepts, ecological status, economic importance of Chlorophyta (Algae), Phycomycetes (Fungi) & Hepaticae (Bryophytes) & outline of their classification in general. • It also gives students hands-on competence of studying them in nature & identifying them based on their morphological & anatomical features.
UNIT II	Fungi	
UNIT III	Bryophyta	
USMABO102	FORM AND FUNCTION I	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	Cell Biology	<ul style="list-style-type: none"> • It develops knowledge of the cell as a unit of life & as a tool to study plants, ecology & role of genetics in everyday life & its importance. • It also gives students an insight into ecological features in plants. • Importance of plants in breeding experiments & their importance in agriculture.
UNIT II	Ecology	
UNIT III	Genetics	

SEMESTER II

COURSE CODE	TITLE	CREDITS & COURSE OUTCOME
USMABO201	PLANT BIODIVERSITY II	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	Pteridophyta	<ul style="list-style-type: none"> • It develops knowledge of the basic concepts, life cycles, evolution, ecological status, economic importance of Pteridophytes, Gymnosperms & Angiosperms & outline of their classification in general. • To understand the diversity of plants & their parts and be able to describe & identify them in the field along with their economic importance.
UNIT II	Gymnosperms	
UNIT III	Angiosperms	
USMABO202	FORM AND FUNCTION II	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	Anatomy	<ul style="list-style-type: none"> • It develops the basic anatomical features of plants and identify them based on these features, the physiology of plants & its importance & implications to human life. • Students will understand basic concepts of importance of secondary metabolites produced by plants, importance of enzymes, their functions & mode of action in plants, importance of medicinal plants to humans & their usage in everyday life.
UNIT II	Physiology	
UNIT III	Medicinal Botany	

Visits: A minimum of four field excursions with at least one beyond the limits of Maharashtra for habitat studies are compulsory and record of visits should be duly certified and presented at practical examination

S.Y.B.Sc.**Second Year** is Botany in combination with Chemistry or with Zoology.**SEMESTER III**

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
USMABO301	PLANT BIODIVERSITY III	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	Thallophyta (Algae) & Bryophyta	<ul style="list-style-type: none"> • It develops knowledge of the basic concepts, ecological status, economic importance of Phaeophyta (Algae), Anthocerotae (Bryophytes) & outline of their classification in general. • It also gives students hands-on competence of studying them in nature & identifying them based on their morphological & anatomical features. to identify and classify plants based on Bentham & Hooker's classification of Angiosperms; to Understand basic concepts of preservation methods, microscopy, chromatography and gel electrophoresis.
UNIT II	Angiosperms	
UNIT III	Modern Techniques to Study Plant Diversity	
USMABO302	FORM AND FUNCTION III	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	Cell Biology	<ul style="list-style-type: none"> • It develops knowledge of both conceptual and practical tools for studying the cell organelles, mitosis and meiosis. • Knowledge of cytogenetics renders learning about plastid inheritance and chromosomal aberrations. Students are expected to grasp the idea of nucleic acid, DNA, RNA and mechanism of replication in prokaryotes and eukaryotes. Students will also be able to learn to estimate DNA and RNA from
UNIT II	Cytogenetics	
UNIT III	Molecular Biology	

		plant material and the concept of inheritance of sex linked diseases, genic balance theory in Drosophila and Lyon's hypothesis.
USMABO303	CURRENT TRENDS IN PLANT SCIENCES I	• CREDITS: 2
UNIT I	Pharmacognosy and phytochemistry	<ul style="list-style-type: none"> • It deals with both conceptual and practical tools for studying pharmacognosy and phytochemistry. • The learners will be able to understand about pharmacopoeia both Indian herbal and Ayurvedic, monograph study of a few plants, forestry in terms of agro-forestry and urban forestry, organic farming, silviculture, aromatherapy and nutraceuticals.
UNIT II	Forestry and Economic Botany	
UNIT III	Industry based on plant products	

SEMESTER IV

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
USMABO401	PLANT BIODIVERSITY IV	• CREDITS: 2
UNIT I	Thallophyta: Fungi, Plant pathology & Lichens	<ul style="list-style-type: none"> • It develops knowledge of the basic concepts, life cycles, evolution, ecological status, economic importance of Ascomycetes (Fungi), Pteridophytes, Gymnosperms, outline of their classification in general. • To understand the diversity of plants & their parts and be able to describe & identify them in the field along with their economic importance. Understand the concept of Geological time-scale and fossil formation process.
UNIT II	Pteridophyta & Paleobotany	
UNIT III	Gymnosperms	

USMABO402	Form and Function IV	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	Anatomy	<ul style="list-style-type: none"> • Understand the different types of plant tissues and their role in plant body, various physiological processes in plant body, the concept of long-day and short-day plants, the application of chromatography for separation of sugars and fermentation exercises. • To understand environmental factors, biogeochemical cycles and their importance and study of community ecology both on the basis of qualitative and quantitative characters. • To learn soil organic matter analysis and quadrat study in field
UNIT II	Physiology & Plant Biochemistry	
UNIT III	Ecology & Environmental Botany	
USMABO403	CURRENT TRENDS IN PLANT SCIENCES II	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	Horticulture	<ul style="list-style-type: none"> • It develops knowledge of Designing gardens, creative botany techniques, basic Plant Tissue Culture techniques, Biostatistics and bioinformatics
UNIT II	Biotechnology	
UNIT III	Biostatistics & Bioinformatics	

Visits: A minimum of four field excursions with at least one beyond the limits of Maharashtra for habitat studies are compulsory and record of visits should be duly certified and presented at practical examination

Third Year is Botany major subject with Applied component Horticulture and Gardening.

To maintain the continuity in the flow of information of higher level at T.Y.B.Sc some of the modules of the earlier syllabus have been upgraded with the new modules in order to make the learners aware about the recent developments in various branches of Botany

SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
USMABO501	PLANT DIVERSITY V	<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I	Microbiology	<ul style="list-style-type: none"> • Students should be able to Learn microbiological culturing techniques and Isolate micro organisms • It develops knowledge of the basic concepts, ecological status, economic importance of Rhodophyta, Xanthophyta and Bacillariophyta (Algae), Basidiomycetae and Deuteromycetae (Fungi) & outline of their classification in general. • This course will also help students to build on the basic skills regarding methods of controlling plant diseases
UNIT II	Algae	
UNIT III	Fungi	
UNIT IV	Plant Pathology	
USMABO502	PLANT DIVERSITY VI	<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I	Paleobotany	<ul style="list-style-type: none"> • Students should be able to understand Fossilisation of plants and their anatomy, understand how to identify and classify plants based on Bentham & Hooker's classification. • Also to relate the morphology of flowers and fruits to animal interaction, Correlate the anatomical characteristics of various parts of the plant to the habit of the plants, Understand the economic importance of the pollen and pollen morphology as criteria for taxonomic classification.
UNIT II	Angiosperms I	
UNIT III	Anatomy I	
UNIT IV	Palynology	
USMABO503	FORM AND FUNCTION V	<ul style="list-style-type: none"> • CREDITS: 2.5

UNIT I	Cytology and Molecular biology	<ul style="list-style-type: none"> • It develops the knowledge of Ultrastructure and functions of nucleus and mechanism of transcription and translation in prokaryotes and eukaryotes. • Students will learn the relation of water to mineral or solute transportation in plants and the anatomical variations that facilitate the phenomenon, Relate the ecological factors to the existence of plants in a habitat, and the capacity of the plants to combat pollution. • Learn the basic techniques of Plant tissue culture and its applications in propagation of commercially important plants.
UNIT II	Physiology I	
UNIT III	Environmental Botany	
UNIT IV	Plant tissue culture	
USMABO504	CURRENT TRENDS IN PLANT SCIENCES III	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	Instrumentation	<ul style="list-style-type: none"> • It develops the knowledge of working of various instruments used in scientific studies, students will learn about the mushroom cultivation, ethnic traditional medicines, their pharmacognostic evaluation for making monographs, uses of some plants in medicine, in the cosmetics and formulations.
UNIT II	Ethnobotany & Mushroom industry	
UNIT III	Pharmacognosy and medicinal botany	
UNIT IV	Herbal Cosmetology	

SEMESTER VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
USMABO601	PLANT BIODIVERSITY VI	<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I	Bryophyta	<ul style="list-style-type: none"> • The students will understand and conceptualize the

UNIT II	Pteridophyta	classification and life cycle of members belonging to bryophytes, pteridophytes and Gymnosperms, their evolution, diversity, distribution, their ecology, economic importance and their use as pollution indicators
UNIT III	Bryophyta and Pteridophyta: Applied Aspects	
UNIT IV	Gymnosperms	
USMABO602	PLANT BIODIVERSITY VII	<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I	Angiosperms II	<ul style="list-style-type: none"> • Students should be able to Acquire expertise in interpretation of reproductive and vegetative structures through keying and to construct and write keys to separate families and to collect, preserve and identify different plants, know floral morphology, scientific terminology and names of the plants. • This study is useful in field related jobs, in report making, it will also help them in earning income out of it. • Also will understand the far-reaching implication of experimental embryology in crop improvement, encompass the methodology and theory of statistics as applied to problems in the life and health sciences.
UNIT II	Anatomy II	
UNIT III	Embryology	
UNIT IV	Biostatistics	
USMABO603	FORM AND FUNCTION VI	<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I	Plant Biochemistry	<ul style="list-style-type: none"> • It develops the knowledge of biomolecules and enzymes, their properties and reactions to variations of temperatures, pH range and substrates.
UNIT II	Physiology II	

UNIT III	Genetics	<ul style="list-style-type: none"> • Understand the primary role of nitrogen and sugar crucial to understanding the plant physiological processes. • Applying their knowledge of bioninformatics to understand and interpret biological information.
UNIT IV	Bioninformatics	
USMABO604	CURRENT TRENDS IN PLANT SCIENCES IV	<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I	Plant biotechnology I	<ul style="list-style-type: none"> • The students will understand biotechnological concepts of genomic libraries, cloning, gene transcription and hybridization. • Learners will get hands on training on plasmid DNA isolation. Students also get to learn about DNA sequence analysis, PCR and DNA barcoding. • The students will understand phytogeographical regions of India, the consequences of loss of biodiversity and necessity of its conservation. • In economic botany students will learn about oil extraction techniques, chromatographic separation of oil and estimation of saponification value.
UNIT II	Plant biotechnology II	
UNIT III	Plant Geography	
UNIT IV	Economic botany	

Visits : A minimum of four field excursions with at least one beyond the limits of Maharashtra for habitat studies are compulsory and record of visits should be duly certified and presented at practical examination.

T.Y.B.Sc. BOTANY
APPLIED COMPONENT: HORTICULTURE & GARDENING
SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
USMAA CBO501	HORTICULTURE & GARDENING -I	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	INTRODUCTION TO HORTICULTURE	<ul style="list-style-type: none"> • To understand the importance and objectives of Horticulture and its allied fields, Social forestry and government schemes for strategy plantation. • Hands on experience of various propagation methods. • Knowledge of composting methods controlling pests and diseases, irrigation practices and significance of organic farming. • To highlight the potential of these studies to become an entrepreneur or manage horticultural business or become a consultant.
UNIT II	PROPAGATION PRACTICES	
UNIT III	MANURES, FERTILIZERS AND DISEASES	
UNIT IV	GARDEN OPERATIONS FOR HORTICULTURE	

SEMESTER VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
USMAA CBO601	HORTICULTURE & GARDENING -II	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I	LANDSCAPE GARDENING	<ul style="list-style-type: none"> • The curriculum imparts complete knowledge of horticulture plantations, Creative botany, landscape gardening, commercial production, harvest management, preservation technology, marketing and high-tech horticultural production.
UNIT II	HORTICULTURE PRODUCE	
UNIT III	COMMERCIAL PRODUCTION	

UNIT IV	POST HARVEST TECHNOLOGY & ENTREPRENEURSHIP IN HORTICULTURE	<ul style="list-style-type: none"> • To facilitate and train students for taking up and shaping a successful career in Horticulture. • To take up jobs in the booming FMCG sector
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Visits : To Garden /Parks / Nurseries/ Exhibition / Horticulture industries / Research Station and record of visits should be duly certified and presented at practical examination.

B.Sc. in Chemistry

Programme Specific Outcomes PSO: Three year Degree course

First Year is Chemistry in combination with Botany, Zoology, Microbiology or Physics, Biochemistry and Mathematics.

The well-organized curricula including basic as well as advanced concepts in chemistry from first year to third year shall inspire the students for pursuing higher studies in chemistry and for becoming an entrepreneur and also enable students to get employed in the Research Institutes, Industries, Educational Institutes and in the various concerning departments of State and Central Government based on subject chemistry

SEMESTER I

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		• CREDITS: 2
UNIT I		It develops knowledge of the basic concepts of chemical thermodynamics, periodic table and periodicity of properties, qualitative analysis and acid-base theories. It also develops knowledge of organic nomenclature and fundamentals of organic reaction and their mechanisms. It gives students an insight into various fundamental concept of chemistry which they are using in their day to day activities.
UNIT II		
UNIT III		
		• CREDITS: 2
UNIT I		It develops knowledge of stoichiometry, different types of bonds fundamental concept of organic reaction, stereochemistry and green chemistry. It gives students an insight into importance of stoichiometry, stereochemistry and green chemistry and their uses in the higher classes.
UNIT II		
UNIT III		

SEMESTER II

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		It develops knowledge of the basic concepts of real gases, atomic structure, transition elements and group 13 elements. In addition to the above topics it's also provide the knowledge of aromaticity, biomolecules and prospect of chemistry in various field such as higher education, Defence and R&D. Students will understand the role of chemistry in various branches.
UNIT II		
UNIT III		
Paper II		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		It develops the basic knowledge of chemical kinetics, photochemistry, group 14 elements, bioinorganic chemistry and environment chemistry. It does also provide the knowledge of important processes in polymer chemistry and nanotechnology. Students will understand the importance of chemistry in various fields such as polymers and role of chemistry in environment.
UNIT II		
UNIT III		

Visits : A minimum of one visit to national laboratory such as BARC, TIFR etc. and record of visits should be duly certified and presented at practical examination

Second Year is Chemistry in combination with Botany, Zoology, Microbiology, Physics and Biochemistry

To maintain the continuity in the flow of information of higher level at S.Y.B.Sc some of the modules of the earlier syllabus have been upgraded with the new modules in order to make the learners aware about the recent developments in various branches of chemistry

SEMESTER III

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • It develops knowledge of the basic concepts of chemical thermodynamics, chemical kinetics and electrochemistry. • It does also provide the knowledge of physical properties of solution part 1 like polarimetry and refractometry etc. • The learners will be able to understand about the important concept of above mentioned topics.
UNIT II		
UNIT III		
Paper II		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<p>It develops knowledge of chemical bonding, chemistry of coordination compounds and Industrial chemistry. The learners will be able to understand about the important concept of above mentioned topics and role of chemistry in various aspects of industry.</p>
UNIT II		
UNIT III		
Paper III		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • It develops knowledge of the topics such as alcohol, phenols, epoxide, aromatic electrophilic substitution reaction and carbonyl chemistry. It does also provide the knowledge of toxicology, unit operation and processes and overview of chemical industries. The learners will be able to understand the importance of organic chemistry in industries.
UNIT II		
UNIT III		

SEMESTER IV

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • It develops knowledge of the basic concepts of electrochemistry part 2, solid state chemistry and catalysis. • The learner will be able to understand the importance of catalyst and solid state chemistry in industry. • It does also provide the knowledge of physical properties of solution part 1 like viscosity and surface tension etc.
UNIT II		
UNIT III		
Paper II		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • Understand the different types of bonding of coordination compounds, Ions in aqueous medium, bioinorganic and industrial chemistry.
UNIT II		
UNIT III		
Paper III		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • It develops knowledge of enolate chemistry, nitrogen containing compounds, carboxylic and sulphonic acid derivatives, environmental aspect of chemistry. • It does also provide the knowledge of role of chemistry in synthesis of oils, fats and soap.
UNIT II		
UNIT III		

Visits : A minimum of 1-2 visit to national laboratory such as BARC, TIFR etc. and record of visits should be duly certified and presented at practical examination

Third Year is Chemistry major subject with Applied component Drugs and Dyes.

To maintain the continuity in the flow of information of higher level at T.Y.B.Sc some of the modules of the earlier syllabus have been upgraded with the new modules in order to make the learners aware about the recent developments in various branches of Chemistry.

SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
PAPER I		<ul style="list-style-type: none"> CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> Students should be able to learn important topics, molecular spectroscopy, electrochemistry part-3, thermodynamics and surface chemistry and colloids. This course will also help students to know the importance of mentioned above topics in day to day activities.
UNIT II		
UNIT III		
UNIT IV		
PAPER II		<ul style="list-style-type: none"> CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> Students should be able to understand the topics such as chemical bonding, solid state chemistry part 2, Inner transition elements, pseudo halogens, interhalogens, chemistry of xenon.
UNIT II		
UNIT III		
UNIT IV		
PAPER III		<ul style="list-style-type: none"> CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> It develops the knowledge of mechanism of organic reaction part-1, stereochemistry, photochemistry, oxidation-
UNIT II		

UNIT III		reduction, heterocyclic chemistry and retrosynthetic chemistry. • Learner will learn the basic concept of mechanism of organic reactions and retrosynthetic analysis.
UNIT IV		
Paper IV		• CREDITS: 2.5
UNIT I		• It develops the knowledge of working of treatment of analytical data, sampling, UV-Visible spectroscopy, Optical methods and method of separation. • Learner will learn the basic concept of spectroscopy, sampling techniques etc.
UNIT II		
UNIT III		
UNIT IV		

SEMESTER VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
PAPER I		• CREDITS: 2.5
UNIT I		• The students will understand the principles and conceptualize the important topics such as chemical kinetics, polymer chemistry part-2, applied electrochemistry and nuclear magnetic resonance (NMR) spectroscopy.
UNIT II		
UNIT III		
UNIT IV		
PAPER II		• CREDITS: 2.5
UNIT I		• Students should be able to acquire the expertise in topic such as coordination chemistry, properties of coordination compounds, organometallic
UNIT II		

UNIT III		chemistry and nanomaterial and medicinal chemistry.
UNIT IV		
PAPER III		• CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> • It develops the knowledge of mechanism of organic reaction part 2, natural product chemistry, biomolecules and spectroscopy (UV, IR, NMR, Mass spectrometry). • Applying their knowledge of various spectroscopic techniques to understand and interpret the structure of organic compounds.
UNIT II		
UNIT III		
UNIT IV		
Paper IV		• CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • The students will understand the important topics of electroanalytical methods, method of separation part-2, titrimetric analysis and concept in quality and miscellaneous methods. • The students will understand important various separation techniques could be utilized in various industrial operations.
UNIT II		
UNIT III		
UNIT IV		

Visits : A minimum of 2-3 visit to national laboratory such as IISER, BARC, TIFR etc and pharmaceutical industry and record of visits should be duly certified and presented at practical examination.

T.Y. B. Sc. CHEMISTRY
APPLIED COMPONENT: DRUGS & DYES
SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • The curriculum imparts complete knowledge of drugs and its different types such as analgesic, antipyretic, anti HIV and antimalarial etc. and different mode of actions. • The students will also learn about the concept of Drug Discovery, Design and Development and importance of nanoparticles in the medicinal chemistry. • To facilitate and train students for taking up and shaping a successful career in drug and pharmaceutical industry.
UNIT II		
UNIT III		
UNIT IV		

SEM VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • To understand the importance of dyes stuffs, optical brighteners and organic pigments in chemistry. Classification of dyes on the basis of its constitution and applications. Dyeing of the fabrics such as cotton with natural and artificial dyes and synthesis of important commercial dyes. To highlight
UNIT II		
UNIT III		

UNIT IV		the potential of these studies to become an entrepreneur or manage dyes and colour business or become a consultant.
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Visits : To visit Chemical/ Pharmaceutical industries/ National Research laboratories and record of visits should be duly certified and presented at practical examination.

B.Sc. in Mathematics

Programme Specific Outcomes PSO: Three year Degree course

First Year is Mathematics in combination with Physics and Chemistry OR Statistics.

Students will learn the fundamental basics real analysis and discrete mathematics. Some of the modules of the earlier syllabus of F.Y.B.Sc. have been upgraded with the new modules in order to make the learners aware about the recent developments in various branches of Mathematics. It has applications to Computer Science, Social Science, Engineering & Technology, Operation Research. Calculus covers the topics such as Real Numbers, Sequences and Series, Limits and Continuity, Differentiation and its Applications.

Discrete Mathematics covers the topics such as Set Theory, Relation, Function, Natural numbers, Equivalence of Sets, Permutations, Counting Techniques, Integers, Complex Numbers, Polynomial with real coefficients.

SEMESTER I

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none">• CREDITS: 2
UNIT I		<ul style="list-style-type: none">• Understand the basic concepts related to Real Numbers and Real Sequences, Convergence of sequences.• Sketching and knowledge of graphs of standard function.
UNIT II		<ul style="list-style-type: none">• Know properties and theorems related to the limit and continuity of functions.• Students will be able to use results, solve problems and write rigorous proofs related to these basic properties of real numbers, sequences, functions, limits and continuity and be aware of the applications to various other disciplines.
UNIT III		
Paper II		<ul style="list-style-type: none">• CREDITS: 2
UNIT I		<ul style="list-style-type: none">• Understand the results of Set theory which are used to study

UNIT II		functions, binary operations, equivalence relations and partition of a set.
UNIT III		<ul style="list-style-type: none"> • Understand and learn the properties of integers and divisibility which are used to introduce the ideas of congruence and linear congruence. • Introduction to basic concepts and theorems in Number Theory. Learn basic properties and theorems related to polynomials with real coefficients.

SEM II

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		• CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • Learn theorems and properties related to continuous functions and differentiability of a function at a point. Understand maxima and minima of a function.
UNIT II		<ul style="list-style-type: none"> • Draw graphs of differentiable functions. Introduction to Differential Equations and types of Solution, Homogenous, Exact differential equation & procedure to solve.
UNIT III		<ul style="list-style-type: none"> • Solve equations reducible to the exact form by using integrating factors (four rules) and Linear differential equations & differential equations reducible to normal form (Bernoulli's equation).
Paper II		• CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • Understand various counting techniques which are used to

UNIT II		handle problems on finite sets and apply in day-to-day life.
UNIT III		<ul style="list-style-type: none"> • Understand and perform different fundamental operations related to permutations and use it in higher courses. • Understand the results in complex numbers which are introduced as the algebraic set of order pairs. • The properties of complex numbers help the students to understand the beauty of results in polynomials. Formulate and solve real life problems using recurrence relation.

Second Year in Mathematics is in combination with Physics OR Statistics.

To maintain the continuity in the flow of information of higher level at S.Y.B.Sc some of the modules of the earlier syllabus have been upgraded with the new modules in order to provide a strong foundation in the basics of Mathematics and additionally prepare the students for a career in industry and motivate them toward further studies and research. Students will learn basics concepts and theorems in Calculus, Algebra, Higher Order Differential Equations and Graph Theory.

SEMESTER III

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		• CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • Learn basic properties, definitions and theorems related to Real Numbers, open sets, limit points, Sequences and subsequences. • Understand convergence/ divergence of an infinite series of real numbers, alternating
UNIT II		
UNIT III		

		<p>series and absolutely convergent series.</p> <ul style="list-style-type: none"> Use various tests of convergence to solve problems. Learn basic concepts and theorems in Riemann Integration and apply to solve problems.
Paper II		<ul style="list-style-type: none"> CREDITS: 2
UNIT I		<ul style="list-style-type: none"> Learn basic concepts related to a System of Linear Equations and find solution for homogeneous systems. Learn various types of matrices, algebra, identities and solve system of linear equations in matrix form. Understand basic concepts and theorems related to vector spaces, subspaces, linear combination of vectors, linear span and generating set, linearly independent vectors and basis of a vector space.
UNIT II		
UNIT III		
Paper III		<ul style="list-style-type: none"> CREDITS: 2
UNIT I		<ul style="list-style-type: none"> Learn basic concepts and theorems related to Second Order Linear Differential Equations with constant coefficients, Operators and Standard Linear differential equations with variable coefficients and System of Differential Equations. Solve problems on Homogeneous differential equations, Wronskian, Linearly dependent and independent solutions. Find general solution of non-homogeneous differential equations. Use Operator method for exponential and sine/cosine functions, Polynomials and
UNIT II		
UNIT III		

		functions of the type $e^{ax}V$ where V is a function of x . Solve System of differential equations, apply Strum's Separation Theorem , Strum's comparision Theorem.
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SEM IV

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • Learn the various important and basic theorems that form applications of Riemann Integration. • Understand and learn basic properties and concepts of limits, continuity, derivative, mean value theorems and integration for functions of several variables. • Learn basic properties, theorems and techniques required to study differentiability of a scalar field and vector field. Find maxima, minima and saddle points for functions in two variables.
UNIT II		
UNIT III		
Paper II		<ul style="list-style-type: none"> • CREDITS: 2

UNIT I		<ul style="list-style-type: none"> • Learn basic concepts and important theorems related to Linear Transformations and Isomorphisms between vector spaces. Represent linear transformations using matrices. • Use matrices to find the solution space and its dimension for a system of linear equations. Basic results and properties of determinants, determinant as a function, using permutations, computation of determinants, check linear dependence/independence of vectors using determinants, solution of system of linear equations and calculate area and volume using determinants. • Learn basic properties, theorems and definitions related to Inner Product Spaces including orthogonal and orthonormal sets.
UNIT II		
UNIT III		
Paper III		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • Learn basic concepts and results of Graph Theory - Types of graphs, basic terminology, Handshaking theorem and its applications, Isomorphism between the graphs and consequences, concepts related to connected graphs, matrices associated with the graphs , Bipartite graphs and Dijkstra's algorithm. • Learn basic concepts related to Trees and relevant results, Spanning tree, algorithms for spanning tree. Knowledge of Eulerian and Hamiltonian graphs and various related algorithms and theorems.
UNIT II		
UNIT III		

Third Year in Mathematics is the major subject with Applied component Computer Programming and System Analysis.

To maintain the continuity in the flow of information of higher level at T.Y.B.Sc some of the modules of the earlier syllabus have been upgraded with the new modules in order to provide a strong foundation in the basics of Mathematics and additionally prepare the students for a career in industry and motivate them toward further studies and research. Students will learn further concepts and theorems in Real Analysis, Calculus, Algebra, Metric Spaces and an introduction to Complex Analysis and Numerical Methods and Analysis.

SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
PAPER I		<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> • Learn and apply important theorems, write rigorous proofs involving multiple Integral. • Evaluate double and triple integrals for area and volume, Understand and apply the basic theory of Line integral of a vector field to solve problems. • Evaluate line integrals directly and by the fundamental theorem. Knowledge of parameterized surfaces, surface integrals, curl, divergence and related theorems and application to solve problems.
UNIT II		
UNIT III		
UNIT IV		
PAPER II		<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> • Understand and know basic properties and theorems involving Quotient Spaces, Orthogonal Linear Transformations and isometries. • Learn basic concepts related to and solve for eigen values and
UNIT II		
UNIT III		

UNIT IV		<p>eigenvectors of a linear transformation.</p> <ul style="list-style-type: none"> • Learn properties of characteristic polynomial of a matrix and theory related to diagonalizability of a matrix. • Introduction to group theory, types of groups, properties and theory of abelian groups, subgroups and cyclic groups. Produce rigorous proofs of propositions arising in the context of abstract algebra involving group theory.
PAPER III		<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> • Learn basic concepts and theory related to Metric Spaces, normed linear spaces, subspaces. • Properties and theorems on sequences in a metric space, involving limit and closure points, dense subsets, Cauchy sequences and complete metric spaces. • Understand and perform mathematical analysis involving continuity of a function in a metric space and uniform continuity.
UNIT II		
UNIT III		
UNIT IV		
Paper IV		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • Understand and apply common numerical methods used to obtain approximate solutions to mathematical problems. • Understand concept of errors, types of errors and rate of convergence of methods. • Solve algebraic and transcendental equations using iteration methods based on first degree, second degree equations and general iteration method. • Solve Polynomials and system of non-linear algebraic equations using
UNIT II		
UNIT III		

UNIT IV		various numerical methods. Solve systems of linear equations using direct and iterative methods. Find eigenvalues and eigenvectors using numerical methods.
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SEMESTER VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
PAPER I		<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> • Learn basic theory related to and distinguish between pointwise and uniform convergence of sequence and series of functions and check for their convergence. Check for continuity of the uniform limit of a sequence or series of real-valued functions. Determine the integral and the derivative of the uniform limit of a sequence of real-valued functions on a closed and bounded interval. Learn basic theory and solve problems involving Power series in \mathbb{R} - radius of convergence, region of convergence, uniform convergence, term-by-term differentiation and integration of power series. Define and analyze limits and continuity for complex functions as well as consequences of continuity, Apply the concept and consequences of analyticity and the Cauchy-Riemann equations and of results on harmonic and entire functions. Evaluate line and contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula, and represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and evaluate complex integrals using the residue theorem.
UNIT II		
UNIT III		
UNIT IV		
PAPER II		<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> • Understand and know further concepts and properties in group theory. Demonstrate examples and provide rigorous proofs of theorems and propositions involving Cosets, Normal Group, Quotient Group, Group
UNIT II		

UNIT III		Homomorphisms and isomorphisms, automorphisms of a group, inner automorphisms. Knowledge of basic theory related to external direct product of a group and related properties. Demonstrate examples wherever applicable and provide rigorous proofs of theorems and propositions involving rings, ring homomorphisms, ideals and properties of ideals, quotient rings, integral domains and fields, prime ideals and maximal ideals, polynomial rings, divisibility in an integral domain, principal ideal domain, Euclidean domain and unique factorization domain.
UNIT IV		
PAPER III		<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> • Knowledge of basic theory of a connected metric space, its determination and characterization, related theorems and properties, concept of path connectedness and examples. • Knowledge of basic theory of a compact metric space, important results and properties and characterization of compact sets and equivalent statements for a set to be compact. • Learn fundamental theory of Fourier series of functions and its applications to solve problems.
UNIT II		
UNIT III		
UNIT IV		
Paper IV		<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I		<ul style="list-style-type: none"> • Understand and apply numerical methods to solve mathematical problems involving interpolation and differentiation. Solve problems using the different methods of interpolation: Lagrange's, Iterated, Newton's divided difference, Finite difference operators, Piecewise linear and quadratic and bivariate interpolation. • Use numerical methods to perform differentiation, Partial differentiation, integration, composite integration and double integration.
UNIT II		
UNIT III		

UNIT IV	<ul style="list-style-type: none"> Find solution of Initial value problems of an ordinary first order differential equations using the various one step and multistep numerical methods.
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T.Y.B.Sc. Mathematics
APPLIED COMPONENT: Computer Programming and System Analysis

SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		<ul style="list-style-type: none"> CREDITS: 2
UNIT I		<ul style="list-style-type: none"> Knowledge of basic programming using Python Language – the Data types and expressions. Write programs using loops and selection statements: Conditional and alternative statements, Chained and Nested Conditionals, Definite Iteration and Conditional Iteration. Knowledge of strings, lists, tuples, dictionaries and user defined functions in Python. Basic introduction to SageMath and applications involving differential equations, Algebra, Number Theory, Graph theory etc.
UNIT II		
UNIT III		
UNIT IV		

SEMESTER VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		<ul style="list-style-type: none"> CREDITS: 2
UNIT I		<ul style="list-style-type: none"> Further programming using Python language and various Python libraries used in machine

UNIT II		learning Numpy, Scipy, Mathplot, Sklearn and Pandas.
UNIT III		<ul style="list-style-type: none"> • Understand concept of Data Science its benefits and uses, the data science process, define research goals and create a project, retrieve, clean, integrate and transform data. Introduction to concept of machine learning and types of machine learning.
UNIT IV		<ul style="list-style-type: none"> • Perform basic data analysis – sort data, create plots, sample data etc.

M.Sc. (Mathematics) PG Degree program.

PO1. Assess the existing knowledge. Concepts, techniques and methodology appropriate to the post graduate chosen discipline.

PO2. Conceive and plan a high-quality research project in the appropriate disciplinary or multidisciplinary context.

PO3 Synthesize Complex information appropriate to the discipline.

PO4. Apply discipline-based and / or cross-discipline based knowledge to design a problem solving strategy.

PO5. Employ expressive power appropriate to the discipline.

PO6. Exhibit disciplined work habits as an individual.

PSO1. Students should see a number of contrasting but complementary points of view in the topics continuous and discrete technique (algebraic and geometric) and approaches (theoretical and applied) to mathematician.

PSO2. Students will develop mathematical thinking, progressing from a computational understanding of mathematics to a broad understanding encompassing logical reasoning, generalization, abstraction and formal proof.

PSO3. Students will acquire sufficient knowledge and proficiency in the use of appropriate technology to assist in the learning and investigation of mathematics.

PSO4 Students will study of least one of mathematics in depth, drawing on ideas and tools from previous coursework to extend their understanding.

CO1. Knowledge. Provide sufficient knowledge of principles, concepts and ideas and know how to use them for solving and interpreting.

CO2, Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various, fields of science.

CO3. Enhancing student's overall development and to equip them with mathematical ability, problem solving skills, creative talent a power of communication necessary for various kinds of employment.

CO4. A Student should be able to recall basic facts about mathematics and should be able to apply knowledge of numerical analysis and differential equation.

CO5. A student should get a relational understanding of mathematical concepts and concerned complex problems.

CO6. A student should get adequate exposure to global and local concerns that explore them many aspects of mathematical sciences.

Ujwala Deshmukh

Co-ordinator (M. Sc. Mathematics).

Microbiology

PROGRAMME OUTCOMES, PROGRAMME SPECIFIC OUTCOMES AND COURSE OUTCOMES

PROGRAM OUTCOMES	<p>At the end of the graduate programme in science, the learner should be able to-</p> <ul style="list-style-type: none"> • Develop effective communication skills <ul style="list-style-type: none"> ○ Write effective reports and technical documents for various audiences ○ Perform library research, collate the findings and present them lucidly. • Develop higher cognitive skills <ul style="list-style-type: none"> ○ Analyze problems and find solutions • Cultivate virtues • Develop focus and depth in one or more disciplines • Develop leadership skills • Develop a global perspective • Prepare for lifelong learning
PROGRAM SPECIFIC OUTCOMES	<p>By the end of the programme in Microbiology, graduates should be able to-</p> <ol style="list-style-type: none"> a. Articulate and communicate in the specialized terminology pertaining to microbiology. b. Define and explain the theories and practices of the various fields/ disciplines in microbiology. c. Explain the technologies and methods commonly used in microbiology. d. Acquire the requisite skills applicable to microbiological research and clinical methods. e. Describe the genetic and ecological relationships between microorganisms. f. Discuss the applications of microorganisms in the various areas of biotechnology.

F.Y.B.Sc. SEMESTER I

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I	FUNDAMENTALS OF MICROBIOLOGY	<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • Will enable the learner to describe the ultrastructure of the cell. The learner will get familiarized with various techniques required for the observation and cultivation of microorganisms.
UNIT II		
UNIT III		
Paper II	APPLIED MICROBIOLOGY	<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • Will enable the learner to describe the various means of controlling microorganisms and discuss the chemical agents that may do the same. • It will also entail that the learner is able to apply the norms of biosafety whilst working with microorganisms. • The learner will be able to discuss the modes of transmission of various diseases. They will also be able to describe various control measures to prevent the spread of these diseases.
UNIT II		
UNIT III		

F.Y.B.Sc. SEMESTER II

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I	Microbial chemistry	<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • Will enable the learner to enlist the various types of carbohydrates and lipids.

UNIT II		<ul style="list-style-type: none"> The learner will be able to explain various microscopic methods used in the study of microorganisms and employ various instrumental techniques for the study of biomolecules. Upon completion of this course the learner will also be able to describe the various phases of microbial growth and calculate the growth rate.
UNIT III		
Paper II	Exploring microorganisms	<ul style="list-style-type: none"> CREDITS:
UNIT I		<ul style="list-style-type: none"> Will enable the learner to evolve a better appreciation for the diversity of microbial life. The learner will have a deeper understanding of the various applications of microorganisms.
UNIT II		
UNIT III		

S.Y.B.Sc. SEMESTER III

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I	Medical microbiology and Immunology	<ul style="list-style-type: none"> CREDITS: 2
UNIT I		<p>The learner should be able to</p> <ul style="list-style-type: none"> Appreciate the several lines of defence and how they come in to play during an immune response. Build upon the knowledge of host normal biota and its role in host defence. Elaborate upon intricacies of the collection of pathological samples and cultivation of pathogens in the laboratory.
UNIT II		
UNIT III		
Paper II	Environmental microbiology	<ul style="list-style-type: none"> CREDITS:
UNIT I		The learner should be able to-

UNIT II		<ul style="list-style-type: none"> • Understand existence of various microorganisms in the biosphere. • Explain the role of microorganisms in various ecological niches. • Learn the methods to study various ecological niches.
UNIT III		
Paper III	Biology of macromolecules and metabolism	<ul style="list-style-type: none"> • CREDITS:
UNIT I		<p>The learner should be able to-</p> <ul style="list-style-type: none"> • Understand the structural chemistry of amino acids, proteins and nucleic acids. • Understand the relevance of thermodynamics in the biological system. • Analyse various biomolecules.
UNIT II		
UNIT III		

S.Y.B.Sc. SEMESTER IV

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I	Applications and research in microbiology	<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<p>The learner should be able to</p> <ul style="list-style-type: none"> • Describe methodologies used for bacterial taxonomy and use of Bergey's manual of systematic bacteriology in classification. • Appreciate the contemporary issues in Microbiology • Handle and use some the instruments.
UNIT II		
UNIT III		
Paper II	Industrial, food and dairy microbiology	<ul style="list-style-type: none"> • CREDITS:
UNIT I		<p>The learner should be able to-</p> <ul style="list-style-type: none"> • Understand interaction of microorganism in food, milk & milk products as well as
UNIT II		

UNIT III		<ul style="list-style-type: none"> • Factors affecting their growth in food. • Describe milk and food -borne pathogens. • Discuss the role of microorganisms in food spoilage. • Explain methods of preservation of milk, milk products and various types of food and food products • Comprehend screening of industrially important microorganisms from various environments, types of fermentation and media.
Paper III	Molecular biology and enzymology	<ul style="list-style-type: none"> • CREDITS:
UNIT I		<p>The learner should be able to</p> <ul style="list-style-type: none"> • Explain how DNA encodes genetic information • Describe structure and properties of different classes of RNA. • Discuss how DNA directs RNA and protein synthesis • Explain the process of transcription and translation in prokaryotes and eukaryotes • Discuss differences in transcription and translation • Understand the basic concepts in Enzymology
UNIT II		
UNIT III		

T.Y.B.Sc. SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
PAPER I	Microbial genetics	CREDITS: 2.5
UNIT I		Students should be able to: <ul style="list-style-type: none"> • Describe the mechanism involved in DNA replication. • Explain cell cycle and cell signalling. • Describe the types and causes of mutations in DNA and mechanisms involved in DNA repair. • Explain the basic concepts of homologous recombination and genetic exchange among prokaryotes.
UNIT II		
UNIT III		
UNIT IV		
PAPER II	Medical microbiology and Immunology: Part I	<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I		(Medical Microbiology): Students should be able to- <ol style="list-style-type: none"> a. Identify common infectious agents and the diseases that they cause. b. Evaluate methods used to identify infectious agents in the clinical microbiology laboratory. c. Recall microbial physiology including metabolism, regulation and replication d. Explain general and specific mechanisms by which an infectious agent causes disease. e. Describe the modes of action of different antibiotics as also the means by which resistance to these are acquired by pathogens. Learning Outcomes (Immunology): Students should be able to- <ol style="list-style-type: none"> a. Identify the cellular and molecular basis of immune responsiveness b. Elaborate upon the types of immunoglobulins and the reactions mediated by them
UNIT II		
UNIT III		
UNIT IV		

		<p>c. Explain the mechanisms of activation of the complement cascade</p> <p>d. Describe the role of the lymphocytes in the immune response</p>
PAPER III		<ul style="list-style-type: none"> • CREDITS: 2.5
UNIT I		<p>Students should be able to-</p> <ul style="list-style-type: none"> • Understand the architecture of the membrane and how solute is transported inside the cell. • Describe and explain the electron transport chains in prokaryotes and mitochondria and understand the mechanism of ATP synthesis. • Explain bioluminescence mechanism and its significance. • Describe and explain photosynthesis. • Understand utilization of simple and complex carbohydrates by central metabolic pathways. • Apply the concepts of energetics and catabolism in biodegradation of various substrates. • Understand utilization of inorganic nitrogen and sulphur.
UNIT II		
UNIT III		
UNIT IV		
Paper IV	Bioprocess technology	
UNIT I		<p>Students should be able to-</p> <ol style="list-style-type: none"> Apply newer approaches for screening various microbial metabolites Describe the applications of microbes and its strain improvement in Industrial Microbiology Design media, growth conditions and techniques for producing and recovering different types of products of commercial value Describe the design of bioreactors for different applications and its process parameters
UNIT II		
UNIT III		
UNIT IV		

T.Y.B.Sc. SEMESTER VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
PAPER I	rDNA technology, bioinformatics and virology	CREDITS:
UNIT I		Students should be able to- <ol style="list-style-type: none"> a. Describe the basic concepts and techniques of recombinant DNA technology b. Explain the basic concepts of Bioinformatics. c. Describe the basic structure, classification, , enumeration, cultivation and life cycle of viruses d. Explain the role of viruses in cancer and diseases caused by prions and viroids e. Have an understanding of regulation of lambda phage
UNIT II		
UNIT III		
UNIT IV		
	Medical microbiology and immunology: Part II	Credit:
UNIT I		(Medical Microbiology): Students should be able to- <ol style="list-style-type: none"> a. Identify common infectious agents and the diseases that they cause. b. Evaluate methods used to identify infectious agents in the clinical microbiology laboratory c. Recall microbial physiology including metabolism, regulation and replication d. Explain general and specific mechanisms by which an infectious agent causes e. disease f. Describe the modes of action of different antibiotics as also the
UNIT II		

UNIT III		<p>means by which resistance to these are acquired by pathogens.</p> <p>Learning Outcomes (Immunology): Students should be able to-</p> <ol style="list-style-type: none"> Describe the immunological response and how it is triggered and regulated Explain the cellular and molecular aspects of lymphocyte activation, homeostasis, differentiation, and memory Define the cellular/molecular pathways of humoral/ cell-mediated adaptive responses Describe the mechanisms of antigen-antibody reactions and their relevance in diagnosis. Explore strategies for vaccine development.
UNIT IV		
	Microbial biochemistry: Part II	Credit
UNIT I		<p>Students should be able to-</p> <ul style="list-style-type: none"> Understand different types of fermentative metabolism of carbohydrates and will be able to apply this knowledge in process biotechnology. Understand synthesis of glucose from non-carbohydrate molecules in cell. Understand biosynthesis of capsule, cell wall. Understand the reactions involved in metabolism of lipids and hydrocarbons. Describe and explain protein catabolism & anabolism. Explain nucleic acid metabolism and recycling of nucleotides. Understand regulation of metabolism in bacteria at various level.
UNIT II		
UNIT III		
UNIT IV		

	APPLIED AND INDUSTRIAL MICROBIOLOGY	Credit
UNIT I		Students should be able to- <ol style="list-style-type: none"> a. Explain the various steps involved in downstream processing and effluent treatment b. Design an industrial process keeping in view the strict guidelines for its recovery and disposal c. Appreciate the importance of carbon credits d. Enlist the applications of enzymes in various fields e. Describe the working of important instruments used in biochemical analysis f. Enlist the salient features of quality management and regulatory procedures
UNIT II		
UNIT III		
UNIT IV		

BACHELOR OF SCIENCE (B.Sc.) - PHYSICS

Programme Outcomes (POs):

Students of B.Sc. Programme, with Physics as a major subject, at the time of graduation will be able to:

- 1. Physics knowledge:** Understand fundamental theories and principles of Physics, which includes Nuclear Physics, Electrodynamics, thermodynamics, waves & optics, materials science, Atomic and Molecular Physics, Classical Mechanics, Quantum Mechanics, Statistical Mechanics, Mathematical Physics, Solid state Physics, Electronics, C++ programming language, AVR microcontroller and its applications in different areas of science and technology.
- 2. Analytical abilities and practical skills:** Develop analytical abilities towards complex problem solving and acquire laboratory practical skill required to transform Physics knowledge into real life applications for society.
- 3. Skills and Life-long learning:** Acquire skills like collaboration, communication, and independent leaning and prepares for lifelong learning to overcome challenges ahead.
- 4. Competitive examinations:** Clear entrance tests for higher studies and competitive examination for public sectors and Civil service.

Programme Specific Outcome (PSOs) of B.Sc. - Physics:

F.Y.B.Sc.– Physics with subject combination of

Chemistry/Mathematics/Statistics/Botany/Zoology (Sem-I and II) :

Students of B.Sc. Programme, at the time of completion of semester I and II will be able to:

1. Understand fundamentals of Physics including Mechanics, Waves, optics, Modern Physics, Electricity, Magnetism and cosmology.
2. Understand real life applications of Mechanics, Optics, electricity, magnetism and cosmology in different area of science and technology.
3. Solve numerical problems based on real life applications of all the topics covered.
4. Perform laboratory experiments based on theory topics and acquire skills in use of laboratory equipment, collect data through observation and interpretation of data.

S.Y.B.Sc.-Physics (Sem-III and IV): Physics with subject combination of Chemistry/Mathematics

Students of B.Sc Programme, at the time of completion of semester III and IV will be able to:

1. Understand Physics including advanced optics, Material science, Thermodynamics, Quantum Physics, Analog electronics and Statistical Physics.
2. Understand real life applications of advanced optics, Material science, Quantum Physics, Analog electronics and Statistical Physics in different area of science and technology
3. Solve numerical problems based on applications of all the topics covered in theory.
4. Perform Physics experiments related to theory topics and acquire skills in use of laboratory equipment, ability to collect data through observation and interpreting data.

T.Y.B.Sc. – with Physics as a major subject (Semester-V and IV):

Students of B.Sc. Programme, at the time of completion of semester V and VI will be able to:

1. Understand theory of sub branches of Physics including Mathematical Physics, Nuclear Physics, Electronics, Solid state Physics, Electrodynamics, Atomic and molecular Physics, Classical Mechanics and Special theory of relativity.
2. Understand real life applications and solve problems based on applications of the topics covered in theory.
3. Perform Physics experiments related to theory topics and acquire skills in use of laboratory equipment, ability to collect data through observation and interpretation of data.

T.Y.B.Sc. Physics- Applied component: C++ Programming, AVR Microcontroller and VHDL (Semester-V and IV):

Students of B.Sc. Programme, at the time of completion of semester V and VI will be able to:

1. Understand fundamentals of C ++ programming, AVR Microcontroller and VHDL.
2. Acquire skill in perform C++ programming and trouble shooting of electronic circuits.
3. Learn interfacing of electronic circuit with microcontroller and its application in electronic instrumentation and industrial automation.

Course Outcomes (COs)

PROGRAM: BACHELOR OF SCIENCE (B. SC.) - PHYSICS

F. Y. B. Sc. Physics

SEMESTER-I

COURSE CODE	TITLE	CREDITS & COURSE OUTCOME
USMAPH101	Mechanics	2 credits
Unit I	Newton's laws	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand Newton's laws of motions, theory of mechanical oscillations, elasticity and fluid dynamics and gravitation. 2. Develop ability to solve problems based on applications of all the topics covered in theory. 3. Enable students to learn Physics at higher standard.
Unit II	Elasticity, fluid dynamics and oscillations	
Unit III	Gravitation	
USMAPH102	Waves and optics	2 credits
Unit I	Waves	<p>On successful completion of this course, students will be able to do :</p> <ol style="list-style-type: none"> 1. Understand fundamentals of wave mechanics, Geometric Optics, interference of light, working of laser and its applications. 2. Solve problem based on real life applications of topics covered. 3. Enable students to learn Physics at higher standard.
Unit II	Optics	
Unit III	Laser	
USMAPHP112	Physics Practical	<p>2 credits</p> <p>On successful completion of this course, students will be able to :</p> <ol style="list-style-type: none"> 1. Perform standard Physics experiments based on concepts of Sound, mechanics and optics. 2. Acquire skills in use of laboratory equipment. 3. Acquire ability to collect data through observation and interpreting data. 4. Understand laboratory procedures including safety, and scientific methods.

F.Y.B.Sc. - Physics

SEMESTER-II

COURSE CODE	TITLE	CREDITS & COURSE OUTCOME
USMAPH201	Electricity and magnetism	2credits
Unit I	Electrostatics	On successful completion of this course, students will be able to: <ol style="list-style-type: none"> 1. To understand fundamental laws of electrostatics, magnetostatics and of direct and alternating current. 2. Understand various applications of these topics in technology. 3. Acquire quantitative problem solving skills in all the topics covered. 4. Enable students to learn Physics at higher standard.
Unit II	Magnetostatics	
Unit III	Direct current and alternating current.	
USMAPH202	Modern Physics and cosmology	2 credits
Unit I	Light and matter waves	On successful completion of this course, students will be able to <ol style="list-style-type: none"> 1. To understand fundamentals of origin of quantum theory, production of X rays, Compton Effect, nuclear structure, nuclear properties, particle physics and cosmology. 2. Understand various real life applications of these topics in modern science and technology. 3. Acquire quantitative problem solving skills in all the topics covered 4. Enable students to learn Physics at higher standard.
Unit II	Introduction to Nuclear Physics	
Unit III	Particle Physics and Cosmology	
USMAPHP212	Physics Practical	2 credits
		On successful completion of this course students will be able to:

		<ol style="list-style-type: none"> 1. Perform standard Physics experiments related to electrostatics, magneto statics and nuclear physics. 2. Acquire skills in use of laboratory equipment. 3. Acquire ability to collect data through observation and interpretation of data. 4. Understand laboratory procedures including safety and scientific methods.
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S.Y.B.Sc. Physics

SEMESTER-III

COURSE CODE	TITLE	CREDITS & COURSE OUTCOME
USMAPH301	Advanced optics	2 credits
Unit I	Polarization	On successful completion of this course, students will be able to: <ol style="list-style-type: none"> 1. Understand fundamentals of Polarization, diffraction, working and applications of interferometers and determination of resolving power of optical instruments. 2. Understand various real life applications of these topics in science and technology. 3. Acquire quantitative problem solving skills in all the topics covered
Unit II	Diffraction	
Unit III	Interferometry and Resolving Power of Instruments	
USMAPH302	Material Science	2 credits
Unit I	Material classification and crystal geometry	On successful completion of this course, students will be able to: <ol style="list-style-type: none"> 1. Understand the concepts of crystal geometry, classification of materials, synthesis, and characterization of nanomaterials.
Unit II	Synthesis and analysis of nanomaterials	

Unit III	Material Properties & Applications	<ol style="list-style-type: none"> 2. Understand various real life applications of these topics in technology. 3. Enable students to learn Physics at higher standard. 4. Acquire problem solving skills in all topics covered .
USMAPH303	Thermodynamics	2 credits
Unit I	Real gases and transport phenomena	<p>On successful completion of this course, students will be able to :</p> <ol style="list-style-type: none"> 1. Understand the basic concepts of thermodynamics & its applications in physical situation. 2. Understand the science of low temperature production. 3. Understand various real life applications of these topics in technology. 4. Enable students to learn Physics at higher standard 5. Acquire problem solving skills in all topics.
Unit II	Carnot's Theory of heat engine	
Unit III	Third law of thermodynamics and Entropy	
USMAPHP3123	Physics Practical	

S.Y.B.Sc.-Physics

SEMESTER-IV

COURSE CODE	TITLE	CREDITS & COURSE OUTCOME
USMAPH401	Thermal and statistical Physics	2 credits
Unit I	Liquefaction of gases and Maxwell's equations	On successful completion of this course, students will be able to : 1. Understand the basic concepts of Liquefaction of gases and Maxwell's equations, Thermal and statistical Physics, applications in physical situations. 2. Understand various real life applications of these topics in technology. 3. Acquire quantitative problem solving skills in all the topics covered
Unit II	Thermal physics	
Unit III	Statistical Physics	
USMAPH402	Quantum Physics	2 credits
Unit I	The Schrodinger wave equation	On successful completion of this course, students will be able to : 1. Understand the postulates of quantum mechanics and to understand its importance in explaining significant phenomena in atomic and Molecular Physics. 2. Understand applications and acquire quantitative problem solving skills in all the topics covered. 3. Enable students to learn Quantum Physics at higher standard
Unit II	Applications of Schrodinger steady state equation-I	
Unit III	Applications of Schrodinger steady state equation-II	
USMAPH403	Electronics	2 credits
Unit I	Diodes and its application	On successful completion of this course, students will be able to: 1. Understand the basics of Diodes and its application.

Unit II	Transistors	<ol style="list-style-type: none"> 2. Understand the basics of transistor biasing, operational amplifiers and their applications. 3. Understand the basic concepts of oscillators and its application..
Unit III	Operational Amplifier	<ol style="list-style-type: none"> 4. Enable students to learn advanced electronics at higher standard 5. Acquire problem solving skills in all the topics covered.
USMAPHP4123	Physics Practical	<p style="text-align: center;">3 credits</p> <p>On successful completion of this course, students will be able to do :</p> <ol style="list-style-type: none"> 1. Perform standard Physics experiments related simulations of Quantum mechanics problems and electronics. 2. Acquire skills in use of laboratory equipment, tools. 3. Acquire ability to collect data through observation and interpreting data. 4. Understand laboratory procedures including safety, and scientific methods.

T. Y. B. Sc.-Physics
SEMESTER-V

COURSE CODE	TITLE	CREDITS & COURSE OUTCOME
USMAPH501	Mathematical Physics	2.5 credits
Unit I	Matrices and complex analysis	<p>On successful completion of this course, students will be able to do :</p> <ol style="list-style-type: none"> 1. Understand fundamentals of Fourier series, complex analysis and special functions, differential equation, Fourier transform Numerical techniques and MATLAB. 2. Solve problem based on applications of topics covered. 3. Enable students to learn Physics at higher standard
Unit II	Differential equations and special functions	
Unit III	Fourier series and transforms	
Unit IV	Numerical Techniques and introduction to MATLAB	
USMAPH502	Analog and Digital Electronics	2.5credits
Unit I	MOSFET, Thyristors and special purpose amplifiers	<p>On successful completion of this course, students will be able to</p> <ol style="list-style-type: none"> 1. Understand working of different electronic devices including JFET, MOSFET, TRIAC, DIAC, design of power supplies, digital electronics. 2. Learn industrial applications of different devices. 3. Enable students to learn advanced electronic technology.
Unit II	Filters, oscillators and timers	
Unit III	Digital electronics	
Unit IV	Electronic communication techniques	
USMAPH503	Nuclear physics	2.5 credits

Unit I	Radioactive decay	<p>On successful completion of this course, students will be able to</p> <ol style="list-style-type: none"> 1. Understand fundamentals of origin of alpha, beta and gamma decay, their energetics and decay schemes, liquid drop model, particle accelerators, nuclear reactors and fundamentals of elementary particles. 2. Understand various real life applications like nuclear power plant, particle accelerators and detectors. 3. Acquire quantitative problem solving skills in all the topics covered. 4. Enable students to learn advanced nuclear theories and applications.
Unit II	Nuclear reactions and nuclear models	
Unit III	Particle detectors and accelerators	
Unit IV	Nuclear energy & elementary particles	
USMAPH504	Electrodynamics	2.5 credits
Unit I	Special techniques for potentials calculation	<p>Learning Outcomes: On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand Electrostatics, magneto statics, Polarization, Magneto statics, Maxwell's equations, wave theory and its applications. 2. Understand various real life applications of these topics in technology based on electrodynamics. 3. Solve the Problem based on topics covered. 4. Enable students to learn advanced theories of electrodynamics.
Unit II	Polarization	
Unit III	Magnetism and varying fields	
Unit IV	Electromagnetic waves	
USMAPHP512	Physics Practical-I	3 credits
		<p>On successful completion of this course, students will be able to do :</p>

		<ol style="list-style-type: none"> 1. Perform standard Physics experiments related MATLAB and electronics. 2. Acquire skills in use of laboratory equipment, tools. 3. Demonstrate an ability to collect data through observation and interpreting data. 4. Demonstrate an understanding of laboratory procedures including safety, and scientific methods.
USMAPHP534	Physics Practical - II	<p style="text-align: center;">3 credits</p> <p>On successful completion of this course, students will be able to do :</p> <ol style="list-style-type: none"> 1. Perform standard Physics experiments related nuclear physics and magnetic properties of materials. 2. Acquire skills in use of laboratory equipment, tools. 3. Acquire ability to collect data through observation and interpreting data. 4. Understand laboratory procedures including safety, and scientific methods.

T.Y.B.Sc. – PHYSICS

SEMESTER-VI

COURSE CODE	TITLE	CREDITS & COURSE OUTCOME
USMAPH601	Classical Mechanics	2.5 credits
Unit I	Central Force	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Learn mechanics of Motion under central force field, Fluid dynamics,
Unit II	Lagrange's equations	

Unit III	Fluid motion and rigid body rotation	rotational motion, Lagrangian Mechanics and chaos theory.
Unit IV	Nonlinear mechanics (chaos)	2. Understand various applications of these topics in technology. 3. solve problems based on topics covered
USMAPH602	Solid State Physics	2.5 credits
Unit I	Electrical properties of metals	On successful completion of this course, students will be able to do : 1. Understand fundamentals of electrical properties of metals, superconductivity, magnetism, conduction in semiconductors and diode. 2. Understand various real life applications of these topics in technology. 3. Enable students to learn advanced theories of semiconductor devices and material science. 4. Solve problem based on real life applications of topics covered.
Unit II	Band theory of solids and Superconductivity	
Unit III	Theory of magnetism	
Unit IV	Semiconductor Physics	
USMAPH603	Atomic and Molecular Physics	2.5 credits
Unit I	Quantum mechanics of harmonic oscillator and Hydrogen atom	On successful completion of this course, students will be able to: 1. Understand the quantum theory of Hydrogen atom, harmonic oscillator, electronic spin orbit coupling, and magnetic field effect on atomic systems, molecular spectra and Raman Effect. 2. Understand various real life applications of these topics in technology.
Unit II	Electronic spin and spin orbit coupling	
Unit III	Effect of magnetic fields on atoms	

Unit IV	Raman effect	<ol style="list-style-type: none"> 3. Enable students to learn Quantum theories on atomic and molecular Physics. 4. Solve Problem solving based on topics covered
USMAPH604	Special Theory of Relativity	2.5 credits
Unit I	Special Theory of relativity & relativistic kinematics	<p>On successful completion of this course, students will be able to</p> <ol style="list-style-type: none"> 1. Understand Special Theory of Relativity, Relativistic Kinematics,, Relativistic Dynamics and Relativity and Electromagnetism 2. Understand various real life applications of these topics in technology. 3. Acquire quantitative problem solving skills in all the topics covered.
Unit II	Relativistic kinematics	
Unit III	Relativistic dynamics	
Unit IV	Relativity and electromagnetism	
USMAPHP612	Physics Practical-I	<p>3 credits</p> <p>On successful completion of this course, students will be able to do :</p> <ol style="list-style-type: none"> 1. Perform standard Physics experiments related solid state Physics and mechanics. 2. Acquire skills in use of laboratory equipment, tools. 3. Acquire an ability to collect data through observation and interpreting data. 4. Understand laboratory procedures including safety, and scientific methods.
USMAPHP634	Physics Practical-II	<p>3 credits</p> <p>On successful completion of this course, students will be able to do :</p> <ol style="list-style-type: none"> 1. Perform standard Physics experiments related to solid state Physics, Atomic and molecular Physics. 2. Acquire skills in use of laboratory equipment, tools.

		<ol style="list-style-type: none"> 3. Acquire ability to collect data through observation and interpretation of experimental data. 4. Understand of laboratory procedures including safety, and scientific methods.
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T. Y. B. Sc. (Applied Component)

SEMESTER-V

COURSE CODE	TITLE	CREDITS & COURSE OUTCOME
USMAPHAC5	C++ PROGRAMMING	2 credits
Unit I	Introduction to C++, Decision making and looping	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand how an existing C++ program works. 2. Understand how C++ improves C with features like object-oriented, operator and function overloading, inheritance and polymorphism. 3. Learn how to write program using Function, arrays, pointers.
Unit II	Functions and Arrays	
Unit III	Pointers, Object initialization and cleanup	
Unit IV	Classes, Polymorphism and virtual member functions	
USMAPHPAC5	Practical of Programming in C++	2 credits
		<p>On successful completion of this course, students will be able to :</p> <ol style="list-style-type: none"> 1. Get hands on experience on use of various digital electronics devices and their application. 2. Learn the syntax and semantics of the C++ programming language.

		<ol style="list-style-type: none">3. Discover errors in a C++ program and describe how to fix them3. Critique a C++ program and describe ways to improve it4. Analyse a problem and construct a C++ program that solves it.
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T. Y. B. Sc. (Applied Component)

SEMESTER-VI

COURSE CODE	TITLE	CREDITS & COURSE OUTCOME
USMAPHAC6	AVR Microcontroller and VHDL	2credits
Unit I	AVR Microcontroller introduction	<p>On successful completion of this course students will be able to:</p> <ol style="list-style-type: none"> 1. Students will be able to understand the concept of microcontroller and embedded system. 2. Students will learn interfacing with microcontroller 3. Students will be able to learn and implement hardware description language and design application specific processors.
Unit II	AVR Programming in C	
Unit III	VHDL-I	
Unit IV	VHDL-II	
USMAPHPAC6	Practical of AVR microcontroller and VHDL	<p align="center">2 credits</p> <p>On successful completion of this course students will be able to :</p> <ol style="list-style-type: none"> 1. Acquire skills in computer interfacing of various electronic circuits using AVR microcontroller and troubleshooting of the circuits. 2. Get hands on experience on use of various electronics components measuring instruments and their applications. 3. Enable students to learn industrial automation. 4. Understand laboratory procedures including safety, and scientific methods.

PROGRAMME: MASTER OF SCIENCE (M.SC.) - PHYSICS

PROGRAMME SPECIFIC OUTCOMES (PSOs):

Students of M.Sc –Physics programme, at the time of completion, will be able to:

1. **Physics knowledge:** Understand advanced theories for various domains of Modern Physics like Nuclear Physics, Electrodynamics, Atomic and Molecular Physics, Classical Mechanics, Quantum Mechanics, Statistical Mechanics, Mathematical Physics, Solid state Physics, Advanced Electronics, Solid state devices, Experimental techniques and electronic communication technology.
2. **Practical skills and analytical abilities:** Develop analytical abilities towards complex problem solving and acquire laboratory practical skill in handling measuring equipment required to transform Physics knowledge into real life applications for benefit of society.
3. **Life-long learning:** Acquire skills like collaboration, communication, and independent leaning and prepares for lifelong learning to overcome challenges ahead.
4. **Research:** Clear competitive examination like SET, NET, JRF, PET and JEST required for pursue research at different research institutes.

COURSE OUTCOMES (COs):

SEMESTER-I

COURSE CODE	COURSE TITIE	COURSE OUTCOME (COs)
PSMAPH101	Mathematical Methods	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand differential equations, power series solutions, theory of complex variable analysis, matrices, tensors, polynomials, special functions, Laplace transform and its applications. 2. Understand various applications of these topics in theoretical physics. 3. Solve problems based on applications of all the topics

PSMAPH102	Classical Mechanics	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand theory of Lagrangian and Hamiltonian formulations, variational Principle, central force field problems, conservation laws, theory of small oscillations, canonical transformations, and angular momentum and Poisson bracket relations. 2. Understand various applications of mechanics in technology.
PSMAPH103	Quantum Mechanics-I	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand fundamentals of Schrodinger's equations, operators, Eigen value, Eigen function, Simple applications of Schrodinger time independent equation to Harmonic oscillator, potential well problems, Hydrogen atom, Linear vector space, Hermitan operators, matrix mechanics, Helbert space, angular momentum and Pauli spin matrices. 2. Understand various applications of this quantum mechanical approach in atomic and nuclear Physics. 3. Solve problems based on applications of all the topics covered. 4. Enable to pursue research in quantum mechanical simulation of atomic and nuclear problems.
PSMAPH104	Solid State Physics	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand fundamentals of crystal structures of materials, concept of Brillouin zones, reciprocal lattice, and theory of diffractions and scattering of EM waves by crystals, Lattice vibrations and thermal properties, concept of phonon wave, theory diamagnetic and paramagnetic materials, and theory of ferromagnetism, magnetic ordering and theory of superconductivity. 2. Understand various real life applications of solid state Physics theory of matter in development of technology. 3. Solve problems based on applications of all the topics covered. 4. Enable to pursue research in material science.

PSMAPHP112	Physics Practical-I	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Plan and perform standard Physics experiments like Michelson Interferometer, Analysis of sodium spectrum, h/e by vacuum photocell,, Study of He-Ne laser- Measurement of divergence and wavelength, Susceptibility measurement by Quincke's method /Guoy's balance method, Absorption spectrum of specific liquids, Coupled Oscillations, carrier life time measurement, Four probe resistivity, Hall effect, and various electronic experiment based on IC. 2. Acquire practical skill in handling measuring equipment, electronic circuit analysis and data interpretations required to practically verify theoretical knowledge of Physics and transform it to real life applications in different area of science and technology.
PSMAPHP34	Physics Practical-II	

SEMESTER-II

COURSE CODE	COURSE TITIE	COURSE OUTCOME
PSMAPH201	Advanced Electronics	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand fundamentals of microprocessors 8085, 8051 microcontroller, instruction set and programming, Analog and data acquisition systems, signal conditioning , Data transmission circuit design, Optical fiber communication system and instrumentation circuit and design. 2. Solve numerical problems based on topics covered 3. Understand various industrial applications of advanced electronics.

PSMAPH202	Electrodynamics	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand fundamentals of Maxwell equations, Maxwellian stress tensors, Lorentz transformations, Electromagnetic waves in matters, frequency dependent electrical and optical properties, polarization of EM waves, wave guide, field radiations from charge particles, radiation from multipole moment, antennas, dipole radiations. 2. Understand various applications of these topics in advanced electrodynamics theories of physics. 3. Solve numerical problems based on topics covered
PSMAPH203	Quantum Mechanics-II	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand fundamentals time independent and time dependent perturbation theories, Fermi Golden rule, variation and WKB approximations, quantum theories of scattering, Born approximations, symmetric and asymmetric wave function, Pauli Exclusion Principle, Relativistic Quantum Mechanics, The Klein Gordon and Dirac equations. Dirac matrices, spinors, positive and negative energy solutions physical interpretation. Nonrelativistic limit of the Dirac equation. 2. Understand various applications of quantum mechanics to modern theories of atomic and nuclear Physics. 3. Solve numerical problems based on topics covered 4. Enable to pursue research in Quantum mechanical simulation of Atomic and nuclear Physics.

PSMAPH204	Solid State Devices	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand fundamentals of energy structures in semiconductors, temperature dependent of carries properties in semiconductors, Carrier life time, Hall Effect, resistivity and carrier life time measurement, properties of P-N junctions, Varactor characteristics, solar cell, metal-semiconductor contacts, heterojunctions, Quantum well structure, field effect transistors, MESFET, MODFET, MOSFET and integrated circuits. 2. Understand various industrial applications of solid state semiconductor devices. 3. Solve numerical problems based on topics covered 4. Enable to pursue research in materials and devices.
PSMAPHP212	Physics Practical-I	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Design and perform standard Physics experiments like Zeeman Effect using Fabry-Perot etalon /Lummer — Gehrecke plate, Characteristics of a Geiger Muller counter and measurement of dead time, Ultrasonic Interferometry-Velocity measurements in different Fluids, Measurement of Refractive Index of, Liquids using Laser, I-V/ C-V measurement on semiconductor specimen, Double slit- Fraunhofer diffraction, .Determination of Young’s modulus, Carrier mobility by conductivity, Measurement of dielectric, constant, Curie temperature and verification of Curie— Weiss law for ferroelectric material, Barrier capacitance of a junction diode, Linear Voltage Differential Transformer, Faraday Effect-Magneto Optics etc, advanced analog and digital electronic experiments based on IC. 2. Acquire practical skill in handling measuring equipment, electronic circuit analysis and data interpretations required to practically verify theoretical knowledge of Physics and transform it to real life applications in different area of science and technology.
PSMAPHP212	Physics Practical-II	

SEMESTER III

COURSE CODE	COURSE TITIE	COURSE OUTCOME
PSMAPH301	Statistical Mechanics	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand the statistical basis of thermodynamics, concept of ensemble, Liouville's theorem and its consequences, microcanonical ensemble and its applications, Grand canonical ensembles and its applications , Quantum mechanical ensemble theory , theory density matrix and its applications. 2. Understand various applications of canonical, micro canonical and grand canonical ensemble theories to thermodynamics properties of matters. 3. Solve numerical problems based on topics covered
PSMAPH302	Nuclear Physics	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand Basic nuclear properties, Q value equation, energy release in fusion and fission reactions, Deuteron and its ground state properties, nucleon-nucleon scattering, Spin -orbit interaction, theories of alpha, beta and gamma particles, interaction of alpha, beta and gamma particles with matter, Nuclear models, compound and direction nuclear reaction, theory of elementary particles. 2. Understand various applications of nuclear Physics to power generator, accelerators, medical field for diagnosis and treatment. 3. Solve numerical problems based on topics covered. 4. Enable to pursue research in nuclear Physics.

PSMAPH303	Signal Modulation and Transmission Techniques	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand theory of transmission lines, concept of characteristic impedance, matching of impedance using stubs, Smith chart and its applications, Propagation of EM waves through environment, Absorption and scattering of EM wave from ionosphere, reflection of electromagnetic wave Theory of antenna, different types of antennas. and their applications. 2. Understand various applications of transmission line, ionosphere effect and antenna in electronic data communication system. 3. Solve numerical problems based on impedance matching of transmission line, antenna design calculations.
PSMAPH304	Microwave Electronics, Radar and Optical Fiber Communication	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Theory of wave guides, wave guide coupling, impedance matching, Cavity resonator, propagation of EM wave through wave guide, Microwave tubes and circuits, Microwave semiconductor devices, Microwave measurements, basic radar systems and applications, design of Optical fiber communication systems, modes of communications and applications. 2. Understand various applications of wave guides, radar systems and optical fiber. 3. Solve numerical problems based on design of optical fiber communication system, radar and wave guide.

PSMAPHP312	Physics Practical-I	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Design and perform standard experiments related to AM modulation and demodulation, characterization of PLL, FM modulation and demodulation using PLL, study of optical fiber communication link, data transmission using optical fiber link, Study of propagation characteristics in a waveguide, Simulation of radiation patterns of various antennas, computation using software for curve fitting and interpolation. 2. Acquire practical skill in handling measuring equipment, electronic circuit analysis and data interpretations required to practically verify theoretical knowledge of Physics and transform it to real life applications in different area of science and technology.
PSMAPHP334	Physics Project work-I	<p>Under the guidance of teacher, student will be able to :</p> <ol style="list-style-type: none"> 1. Acquire the ability to make use of Physics knowledge to generate, develop and evaluate ideas to fulfill the assigned project task. 2. Acquire the skills to communicate effectively and to present ideas clearly. 3. Acquire collaborative skills through working in a team to achieve common goals. 4. Students will be able to learn on their own, reflect on their learning and take appropriate actions to improve it. 5. Develop habit of independent learning and prepares them for lifelong learning and overcome the challenges ahead.

SEMESTER IV

COURSE CODE	COURSE TITIE	COURSE OUTCOME
PSMAPH401	Experimental Physics	<p>On successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Understand the data Analysis for Physical Sciences, Error analysis of experimental data, Vacuum creation techniques, measurement tools for vacuum, leak detection methods, Nuclear detectors, particle accelerators and their applications, working of modern characterization techniques like XRD,XRF, XPS, EDAX , Raman, UV Visible spectroscopy, FTIR spectroscopy, Microscopy: SEM, TEM, AFM 2. Understand various applications vacuum pumps, gauges, accelerators, Characterization techniques. 3. Solve numerical problems based theory of error analysis and vacuum pump speed and particle accelerators.
PSMAPH402	Atomic and Molecular Physics	<p>On successful completion of this course, students will be able to :</p> <ol style="list-style-type: none"> 1. Understand quantum theory of fine structure in Hydrogen atom, Lambe shift, isotope shift, linear and quadratic stark effect, Zeeman effect, Paschen – Bracket effect, quantum theory of two electron atom, central field approximation, Thomas – Fermi potential, The Hertry theory, L-S and J-J couplings, allowed terns in coupling schemes. interaction of electron with EM radiation, emission and absorption rates, Einstein coefficients, selection rules, spectral line shape and width, X –ray spectra, rotational, vibrational and electronic energy levels of diatomic molecules, quantum theory of Raman effect and its applications, General theory of Nuclear Magnetic Resonance (NMR). NMR spectrometer, Principle of Electron spins resonance ESR. ESR spectrometer. 2. Understand applications of quantum mechanical theory of Physics to atomic and molecular phenomenon.. 3. Enable to pursue research in Atonic and molecular Physics.

PSMAPH403	Digital Communication Systems and Python Programming	<p>On successful completion of this course, students will be able to :</p> <ol style="list-style-type: none"> 1. Understand digital modulations techniques, digital transmission techniques, study of PC serial port, fundamental of telephone instruments and circuits, Cellular Phone Concepts, and systems, Python programming language. 2. Understand the industrial applications of digital modulations, telephone instruments and circuits in electronic communication systems.
PSMAPH404	Computer Networking	<p>On successful completion of this course, students will be able to :</p> <ol style="list-style-type: none"> 1. Understand Internet model, OSI model of data communication system, flow and error control in data link layers, Transport layer protocols, fundamental tasks of application layer, network security-cryptography, security protocols in internet, Transport level security, Application layer security, Firewalls and Virtual private network. 2. Understand the industrial applications of computer networking system and protocols.
PSMAPHP412	Physics Practical -I	<p>On successful completion of this course, students will be able to :</p> <ol style="list-style-type: none"> 1. Design and performing electronic communications related experiments like sample and hold ckt using IC, DAC-ADC systems using IC, PPM, PWM, TDM, FSK modulations and demodulation, analog multiplexing, PC to PC communication using TDM trainer kit, experiments using Phonex kit, classical experiment like Millikan's oil-drop method, Raman effect in liquids, e/m by Thomson's method, Rydberg's constant using constant deviation prism. 2. Acquire practical skill in handling measuring equipment, electronic circuit analysis and data interpretations required to practically verify theoretical knowledge of electronics and transform it to real life applications in different area of science and technology.

PSMAPHP434	Physics Project Work-II	<p>Under the guidance of teacher, student will be able to :</p> <ol style="list-style-type: none"> 1. Acquire the ability to make use of Physics knowledge to generate, develop and explore ideas to fulfill the assigned project task. 3. Acquire the skills to communicate effectively and to present ideas. 4. Acquire collaborative skills through working in a team to achieve common goals. 5. Students will be able to learn on their own, reflect on their learning and take appropriate actions to improve it. 6. Develop habit of independent learning and prepares them for lifelong learning and overcome the challenges ahead.
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B.Sc. in Chemistry

Programme Specific Outcomes PSO: Three Year Degree Course

First Year : STATISTICS with the combination PHYSICS and MATHEMATICS.

The learner will study the fundamentals of Descriptive Statistics and Statistical Methods. He/She should be able to

- use appropriate measures and diagrams in order to explain and clarify data they have collected or which are presented to them.
- be familiar with the key ideas of statistics that are accessible to a student with a moderate mathematical competence
- be able to routinely apply a variety of methods for explaining, summarizing and presenting data and interpreting results clearly using appropriate diagrams, titles and labels when required
- The learner will get a strong grounding in probability theory and some grasp of the most common statistical methods. He/she will be able to summarize the ideas of randomness and variability, the way in which these link to probability theory to allow the systematic and logical collection of statistical techniques of great practical importance in many applied areas.
- The learner will be able to distinguish between the different discrete distributions, learn which distribution is to be applied in different scenarios, calculate the probabilities of occurrence for different events.
- The learner will be able to Draw and label a scatter diagram. Calculate r . Explain the meaning of a particular value and the general limitations of r and r^2 as measures, derive the line of best fit, Explain the relationship between regression and correlation.
- Use simple linear regression and correlation analysis and know when it is appropriate to do so.
- Learn time series data and different types of index numbers.
- The learner will be able to distinguish between the continuous distributions and apply them to given problems
- He/She will get introduced to sampling distributions.
- He/She will know how to set up the null and alternative hypotheses for a problem
- By consolidating his familiarity with ideas of randomness and work on the different aspects of hypothesis testing, he will be able to perform inference to test the significance of common measures such as means and proportions and conduct chi-squared tests of contingency tables.

SEMESTER I

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • To make the learner aware of Statistics as a subject, the part played by Statistics in the Indian/Global Scenario. Data types, Presentation of data, representing the data in a tabular form. Qualitative and quantitative characteristics, consistency of data, measures of association, different ways of calculating the Measures of Central Tendency for different data types along with their merits and demerits.
UNIT II		<ul style="list-style-type: none"> • He/She will be made aware of the concept of spread of data and the various measures of dispersion, representing the data in the form of box - plot, the nature of the data using the concept of skewness and kurtosis based on quartiles and moments. • The learner will be able to identify different data types, Prepare schedules and tables to represent data, Draw and interpret: histograms, stem-and-leaf

UNIT III		<p>diagrams, & cumulative frequency distributions.</p> <ul style="list-style-type: none"> • He/She will be able to, identify between quantitative and qualitative characteristics, Prepare contingency tables, find the association and its measure between attributes. Calculate different measures of central tendency and dispersion. Apply the empirical relation between the mean, median and mode. Describe the shape of a curve/distribution.
		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • He will learn the basic concepts of probability, conditional probability and use of prior probabilities. To describe random variables, learn about their types, (discrete as well as continuous), define the function described by the random variables and their properties. The learner will be made aware of the various standard Univariate distributions and the properties and applications of these distributions.
UNIT II		<ul style="list-style-type: none"> • The learner will be capable of applying the ideas and notations involved in set theory to simple examples, recall the basic axioms of probability and apply them, distinguishing between the ideas of conditional probability and independence, draw and use appropriate Venn diagrams, draw and use appropriate probability trees, follow through, on examples and activities and relate the idea of probability to the given examples.
UNIT III		<ul style="list-style-type: none"> • The learner will be capable of applying the ideas and notations involved in set theory to simple examples, recall the basic axioms of probability and apply them, distinguishing between the ideas of conditional probability and independence, draw and use appropriate Venn diagrams, draw and use appropriate probability trees, follow through, on examples and activities and relate the idea of probability to the given examples.

SEMESTER II

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • To identify situations where different time series models can be applied using the methods described above. • Describe the term index. • Understand the difference between a weighted and an unweighted index.
UNIT II		<ul style="list-style-type: none"> • Construct and interpret a Standard index numbers for prices and quantities • Construct and interpret a value index. • Test satisfied by a index number. • The meaning of deflating or real income.
UNIT III		<ul style="list-style-type: none"> • Explain how the Consumer Price Index is constructed and interpreted. • Splice an index number series. • Construct Fixed based and Chain based index numbers.
Paper II		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • Compute areas under the curve for a normal distribution. • He / She will be in a position to explain the relationship between sample size and the standard error of the sample mean, construct a confidence interval for a parameter,

UNIT II		<ul style="list-style-type: none"> • state whether the hypothesis is one-or a two-sided, simple or composite, hence leading to a one- or two-tailed test, • Decide the appropriate distribution to use {for example, normal or Student's t.}. • Compute the degrees of freedom, expected frequencies,
UNIT III		<ul style="list-style-type: none"> • Compute appropriate critical values of chi-squared for a contingency table, • Be able to extend from chi-square to an appropriate test of proportions, conduct chi-square tests for contingency tables, • know when to use Student's t distribution, Conduct test of variances using the F distribution.

Second Year : STATISTICS with the combination MATHEMATICS.

SEMESTER 3

PSO

The purpose of the course is to give the basics of asymptotic analysis in statistics and probability.

The learner will study different aspect of sampling theory.

The learner will get introduced to mathematical statistics, concepts and methods of random sampling and the industrial applications of statistics.

SEMESTER III

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<p>The learner will be able to</p> <ul style="list-style-type: none"> • Calculate moments and moment generating functions • Recall definitions of probability function, density function, cumulative distribution function and moment generating function, and their inter-relationships. • Determine and interpret independence and conditional distributions • Use moment generating function to determine distribution function and moments • Recall well known distributions such as Bernoulli, binomial, Poisson, geometric, uniform • Find distributions of functions of random variables, including distributions of maximum and minimum observations • Recognize common probability distributions for discrete and continuous variables; • Apply methods from algebra and calculus to derive the mean and variance for a range of probability distributions; • Calculate probabilities relevant to multivariate distributions, including marginal and conditional probabilities and the covariance of two random variables; • Derive probability distributions relevant to functions of random variables.
UNIT II		
UNIT III		

Paper II		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<p>The learner will be able to :</p> <ul style="list-style-type: none"> • Define what is sampling and its concept; • Identify the advantages and disadvantages of sampling; • Describe sampling terminologies; • Identify sample size and selection method; and • Differentiate between probability sampling and non-probability sampling techniques. • Decide when to conduct a stratified sampling method. • Compute estimates from stratified sample results. • Students are able to make practical application of above methods. • Avoid nonresponse biases in estimates.
UNIT II		
UNIT III		
Paper III		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • Elucidate techniques and concepts of Statistical Quality Control, Quality Assurance, Performance Analysis and Multi stream process control. • Construct the appropriate Quality Control charts and critically discuss the role of such charts in monitoring a process. • Assess the ability of a process to meet customer expectations. • Develop an appropriate quality assurance plan to assess the ability of the service to meet its required national and international quality standard.
UNIT II		
UNIT III		

		<ul style="list-style-type: none"> • Explain the purpose of acceptance sampling. • Compare and contrast single and multiple sampling plans. • Construct and use the operating characteristic curve. • Determine the average outgoing quality of inspected lots and six sigma units. • Describe project management objectives • Describe the project life cycle. • Diagram networks of project activities • Estimate the completion time of a project.
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SEMESTER IV

PSO

The learner will get introduced to advanced concepts of mathematical statistics. The learner will study the applications of ANOVA for different statistical models. The learner will study the R software which is a requirement as per current industry requirements.

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<p>The learner will know</p> <ul style="list-style-type: none"> • how to compute probability values for a continuous uniform probability distribution and be able to compute the expected value and variance for such a distribution. • The learner will be able to compute probabilities using a normal probability distribution. • The learner will be able to compute probabilities using an
UNIT II		
UNIT III		

		<p>exponential probability distribution</p> <ul style="list-style-type: none"> • The learner will know when to make use of the Central limit theorem and its application, fitting of distribution. • The learner will be able to understand sampling distributions and application of chi square and t distribution. • The learner will be able to understand sampling distributions and applications of the F distribution.
Paper II		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be able to understand the logic Behind an Analysis of Variance (ANOVA), Statistical Test for One-Way ANOVA and Two -Way ANOVA., Latin squares, missing plots, • The concept and designing of factorial experiments.
UNIT II		
UNIT III		
Paper III		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be able to understand how to Assign vectors using different functions, make use of operators, perform basic calculations using inbuilt functions, create diagrams and plots, to learn different inbuilt/library functions of R for standard statistical calculations. • The learner will be able to handle data within R, perform basic data analysis procedures. • The learner will be able to use R to summarize and graph data, calculate confidence intervals, test hypotheses, assess
UNIT II		
UNIT III		

		goodness-of-fit, and perform linear regression, choose the right method to summarize a dataset, graphically and numerically ,perform basic hypothesis tests on a data set, assess whether different variables are linked, using correlation and regression analysis,
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T.Y.B.Sc.

STATISTICS WITH ELEMENTS OF OPERATIONS RESEARCH AS AN APPLIED COMPONENT.

SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
PAPER I		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be introduced to the advance concepts in probability, to compute probabilities of different probability models, the use of occupancy numbers and the theory of runs.
UNIT II		<ul style="list-style-type: none"> • The learner will be able to use the concept of MGF to derive moments of discrete distributions. The learner will know the use of Trinomial and Multinomial distributions.
UNIT III		<ul style="list-style-type: none"> • The learner will be able to solve different types of problems involving the BVN. • The learner learn to test the significance of population correlation coefficient, he will

UNIT IV		<p>learn to make use of Fisher's z-transformation.</p> <ul style="list-style-type: none"> The learner will be able to compute the distributions of the 1st, nth and rth order statistics and able to apply them to different problems.
PAPER II		<ul style="list-style-type: none"> CREDITS:
UNIT I		<ul style="list-style-type: none"> The learner will get to know the terminology used for statistical inference. Also, learn the properties of good estimator and solve different examples involving discrete and continuous probability distributions. The learner will learn the use of MVUE, CRLB, Fishers information and MVBUE involving the parameters of discrete and continuous probability distributions. The learner will be able to find the point estimates of parameters for standard discrete and continuous distributions. Learner will be able to compute point estimates using Bayes' estimation procedure. also be able to compute confidence interval for parameters of standard discrete and continuous distributions
UNIT II		
UNIT III		
UNIT IV		
PAPER III		<ul style="list-style-type: none"> CREDITS:
UNIT I		<ul style="list-style-type: none"> The learner will be introduced to the concepts of epidemic models and will be able to estimate the value of 'p' for different epidemic model.
UNIT II		

UNIT III		<ul style="list-style-type: none"> • He/She will be introduced to different types of bio-assays. He will learn to estimate the potencies for different assays, compute confidence interval using Fieller's theorem and perform ANOVA for different assays. • The learner will be introduced to the basic concept of clinical trials and will know when and how to perform a clinical trial. • The learner will know the concepts of Bioequivalence of drugs, generic and branded. He/She will learn to estimate PK parameters using 'time vs. concentration' profiles. Also, learn to establish Bioequivalence of generic drugs.
UNIT IV		
Paper IV		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The Learner will able to compute and interpret various mortality functions. • The learner will be able to calculate the present and accumulated values for different types of annuities and also to compute the EMI's for loans. • He /She will be able to describe and understand the various types of life annuities. • He/She will obtain the knowledge of life products and hence will be able to distinguish between different types of assurance policies.
UNIT II		
UNIT III		
UNIT IV		

SEMESTER VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
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PAPER I		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The Learner will able to find PGF's of different discrete probability distributions. • Also, will able to use the knowledge of PGF to compute probabilities for different problems. • He/She will get knowledge of stochastic processes and their applications. • Learner will able to construct new stochastic processes based on various real life restrictions. • On successful completion of the course learner will have a good grasp of basic concepts, techniques and results associated with the elementary theory of Markov processes.
UNIT II		
UNIT III		
UNIT IV		
PAPER II		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be able to derive best test for testing simple null hypothesis against simple alternative hypothesis. • The learner will be able to derive best test for testing simple or null hypothesis against composite alternative hypothesis. • The learner will able to derive test for testing simple hypothesis against simple composite hypothesis without fixed sample size and will able to compare it with usual test with fixed sample size. The learner will able to
UNIT II		
UNIT III		
UNIT IV		

		<p>understand various methods of non-parametric tests and concepts related to the testing of hypothesis.</p> <ul style="list-style-type: none"> • Also, able to obtain the theoretical and practical knowledge on the analysis of non-parametric tests.
PAPER III		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be able to transform data in the form of full rank model and will find estimate of parameter. The learner will be able to compute multiple and partial correlation coefficient and also able to will be able to fit regression planes by the method of least squares. He will gain knowledge of: Interpretation of linear regression models, Relationship between correlation and linear regression, Regression coefficients, Interpretation of interaction terms, The assumptions of linear regression analyses, identify violation of the assumptions and learn possible remedies for the violations. The learner will understand the need of time series and its real life examples. Also able to perform calculations of Simple Exponential Smoothing, Double Exponential Smoothing
UNIT II		
UNIT III		
UNIT IV		
Paper IV		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • The learner will learn various measures of Mortality, Fertility.

UNIT II		<p>He will able to perform calculations of various measures of Mortality, Fertility.</p> <ul style="list-style-type: none"> • The learner will learn the concept of reliability, hazard function and its derivation for standard distributions. Also derivation of reliability of series and parallel systems. • The learner will able to compute reliability, hazard function for standard distributions. Also reliability of series and parallel systems. • He/She will be made aware of necessity of simulation in real life and its applications. He will learn the Monte Carlo Technique of Simulation. • The learner will be able to generate random sample from various standard distributions. • Also, will able to use Monte Carlo Technique of Simulation in real examples. He/she will learn the various available products on insurance. He/She will get knowledge of health insurances and pension products, which they can apply in their real life
UNIT III		
UNIT IV		

T.Y. B. Sc.

APPLIED COMPONENT: ELEMENTS OF OPERATIONS RESEARCH

SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		<ul style="list-style-type: none"> • CREDITS:

UNIT I		<ul style="list-style-type: none"> • The learner will be able to formulate a linear programming problem (L.P.P.). Learn the Mathematical Formulation: Maximization & Minimization. Concepts of Solution, Feasible Solution, Basic Feasible Solution, Optimal solution. Graphical Solution for problems with two variables. He will be able to solve an LPP using different techniques. He will be introduced to the concept of Integer programming and solve the corresponding problems using the graphical method and the Gomory's Method. • He will know how to deal with the changes which occur when there is • A Variation in the price vector "c". • A Variation in requirement vector "b". • An addition of a new variable to the LPP • He learn the transportation and assignment problems using different methods • He will learn the processing of n jobs 2 / 3 Machines and the processing 2 Jobs through m Machines • He will learn to take decisions under certainty, uncertainty and risk. The methods which he will learn are Laplace criterion, Maximax (Minimin) criterion, Maximin (Minimax) criterion, Hurwicz α criterion, Minimax Regret criterion. Decision making under risk: Expected
UNIT II		
UNIT III		
UNIT IV		

		<p>Monetary Value criterion, Expected Opportunity Loss criterion, EPPI, EVPI.</p> <ul style="list-style-type: none"> • Bayesian Decision rule for Posterior analysis. Decision tree analysis
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SEMESTER VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be introduced to the concepts of Inventory Control Problems, Deterministic as well as stochastic. • He/She will learn the theory of Replacement of items that deteriorate with time and value of money (i) remains constant; (ii) Changes with time and Replacement of items that fail completely: Individual replacement and Group replacement policies • He/She will be introduced to game theory and information theory. • He/She will learn different techniques/ methods of simulation and its applications • to Inventory and Queuing problems. • Basic elements of the Queuing model. Kendalls Notation. Roles of the Poisson and Exponential distributions.
UNIT II		
UNIT III		
UNIT IV		

		Little's formulae and different queueing models.
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B.Sc. in Chemistry

Programme Specific Outcomes PSO: Three Year Degree Course

First Year : STATISTICS with the combination PHYSICS and MATHEMATICS.

The learner will study the fundamentals of Descriptive Statistics and Statistical Methods. He/She should be able to

- use appropriate measures and diagrams in order to explain and clarify data they have collected or which are presented to them.
- be familiar with the key ideas of statistics that are accessible to a student with a moderate mathematical competence
- be able to routinely apply a variety of methods for explaining, summarizing and presenting data and interpreting results clearly using appropriate diagrams, titles and labels when required
- The learner will get a strong grounding in probability theory and some grasp of the most common statistical methods. He/she will be able to summarize the ideas of randomness and variability, the way in which these link to probability theory to allow the systematic and logical collection of statistical techniques of great practical importance in many applied areas.
- The learner will be able to distinguish between the different discrete distributions, learn which distribution is to be applied in different scenarios, calculate the probabilities of occurrence for different events.
- The learner will be able to Draw and label a scatter diagram. Calculate r . Explain the meaning of a particular value and the general limitations of r and r^2 as measures, derive the line of best fit, Explain the relationship between regression and correlation.
- Use simple linear regression and correlation analysis and know when it is appropriate to do so.
- Learn time series data and different types of index numbers.
- The learner will be able to distinguish between the continuous distributions and apply them to given problems
- He/She will get introduced to sampling distributions.
- He/She will know how to set up the null and alternative hypotheses for a problem
- By consolidating his familiarity with ideas of randomness and work on the different aspects of hypothesis testing, he will be able to perform inference to test the significance of common measures such as means and proportions and conduct chi-squared tests of contingency tables.

SEMESTER I

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • To make the learner aware of Statistics as a subject, the part played by Statistics in the Indian/Global Scenario. Data types, Presentation of data, representing the data in a tabular form. Qualitative and quantitative characteristics, consistency of data, measures of association, different ways of calculating the Measures of Central Tendency for different data types along with their merits and demerits.
UNIT II		<ul style="list-style-type: none"> • He/She will be made aware of the concept of spread of data and the various measures of dispersion, representing the data in the form of box - plot, the nature of the data using the concept of skewness and kurtosis based on quartiles and moments. • The learner will be able to identify different data types, Prepare schedules and tables to represent data, Draw and interpret: histograms, stem-and-leaf

UNIT III		<p>diagrams, & cumulative frequency distributions.</p> <ul style="list-style-type: none"> • He/She will be able to, identify between quantitative and qualitative characteristics, Prepare contingency tables, find the association and its measure between attributes. Calculate different measures of central tendency and dispersion. Apply the empirical relation between the mean, median and mode. Describe the shape of a curve/distribution.
		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • He will learn the basic concepts of probability, conditional probability and use of prior probabilities. To describe random variables, learn about their types, (discrete as well as continuous), define the function described by the random variables and their properties. The learner will be made aware of the various standard Univariate distributions and the properties and applications of these distributions.
UNIT II		<ul style="list-style-type: none"> • The learner will be capable of applying the ideas and notations involved in set theory to simple examples, recall the basic axioms of probability and apply them, distinguishing between the ideas of conditional probability and independence, draw and use appropriate Venn diagrams, draw and use appropriate probability trees, follow through, on examples and activities and relate the idea of probability to the given examples.
UNIT III		

SEMESTER II

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • To identify situations where different time series models can be applied using the methods described above. • Describe the term index. • Understand the difference between a weighted and an unweighted index.
UNIT II		<ul style="list-style-type: none"> • Construct and interpret a Standard index numbers for prices and quantities • Construct and interpret a value index. • Test satisfied by a index number. • The meaning of deflating or real income.
UNIT III		<ul style="list-style-type: none"> • Explain how the Consumer Price Index is constructed and interpreted. • Splice an index number series. • Construct Fixed based and Chain based index numbers.
Paper II		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • Compute areas under the curve for a normal distribution. • He / She will be in a position to explain the relationship between sample size and the standard error of the sample mean, construct a confidence interval for a parameter,

UNIT II		<ul style="list-style-type: none"> • state whether the hypothesis is one-or a two-sided, simple or composite, hence leading to a one- or two-tailed test, • Decide the appropriate distribution to use {for example, normal or Student's t.}. • Compute the degrees of freedom, expected frequencies,
UNIT III		<ul style="list-style-type: none"> • Compute appropriate critical values of chi-squared for a contingency table, • Be able to extend from chi-square to an appropriate test of proportions, conduct chi-square tests for contingency tables, • know when to use Student's t distribution, Conduct test of variances using the F distribution.

Second Year : STATISTICS with the combination MATHEMATICS.

SEMESTER 3

PSO

The purpose of the course is to give the basics of asymptotic analysis in statistics and probability.

The learner will study different aspect of sampling theory.

The learner will get introduced to mathematical statistics, concepts and methods of random sampling and the industrial applications of statistics.

SEMESTER III

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<p>The learner will be able to</p> <ul style="list-style-type: none"> • Calculate moments and moment generating functions • Recall definitions of probability function, density function, cumulative distribution function and moment generating function, and their inter-relationships. • Determine and interpret independence and conditional distributions • Use moment generating function to determine distribution function and moments • Recall well known distributions such as Bernoulli, binomial, Poisson, geometric, uniform • Find distributions of functions of random variables, including distributions of maximum and minimum observations • Recognize common probability distributions for discrete and continuous variables; • Apply methods from algebra and calculus to derive the mean and variance for a range of probability distributions; • Calculate probabilities relevant to multivariate distributions, including marginal and conditional probabilities and the covariance of two random variables; • Derive probability distributions relevant to functions of random variables.
UNIT II		
UNIT III		

Paper II		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<p>The learner will be able to :</p> <ul style="list-style-type: none"> • Define what is sampling and its concept; • Identify the advantages and disadvantages of sampling; • Describe sampling terminologies; • Identify sample size and selection method; and • Differentiate between probability sampling and non-probability sampling techniques. • Decide when to conduct a stratified sampling method. • Compute estimates from stratified sample results. • Students are able to make practical application of above methods. • Avoid nonresponse biases in estimates.
UNIT II		
UNIT III		
Paper III		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • Elucidate techniques and concepts of Statistical Quality Control, Quality Assurance, Performance Analysis and Multi stream process control. • Construct the appropriate Quality Control charts and critically discuss the role of such charts in monitoring a process. • Assess the ability of a process to meet customer expectations. • Develop an appropriate quality assurance plan to assess the ability of the service to meet its required national and international quality standard.
UNIT II		
UNIT III		

		<ul style="list-style-type: none"> • Explain the purpose of acceptance sampling. • Compare and contrast single and multiple sampling plans. • Construct and use the operating characteristic curve. • Determine the average outgoing quality of inspected lots and six sigma units. • Describe project management objectives • Describe the project life cycle. • Diagram networks of project activities • Estimate the completion time of a project.
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SEMESTER IV

PSO

The learner will get introduced to advanced concepts of mathematical statistics. The learner will study the applications of ANOVA for different statistical models. The learner will study the R software which is a requirement as per current industry requirements.

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
Paper I		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<p>The learner will know</p> <ul style="list-style-type: none"> • how to compute probability values for a continuous uniform probability distribution and be able to compute the expected value and variance for such a distribution. • The learner will be able to compute probabilities using a normal probability distribution. • The learner will be able to compute probabilities using an
UNIT II		
UNIT III		

		<p>exponential probability distribution</p> <ul style="list-style-type: none"> • The learner will know when to make use of the Central limit theorem and its application, fitting of distribution. • The learner will be able to understand sampling distributions and application of chi square and t distribution. • The learner will be able to understand sampling distributions and applications of the F distribution.
Paper II		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be able to understand the logic Behind an Analysis of Variance (ANOVA), Statistical Test for One-Way ANOVA and Two -Way ANOVA., Latin squares, missing plots, • The concept and designing of factorial experiments.
UNIT II		
UNIT III		
Paper III		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be able to understand how to Assign vectors using different functions, make use of operators, perform basic calculations using inbuilt functions, create diagrams and plots, to learn different inbuilt/library functions of R for standard statistical calculations. • The learner will be able to handle data within R, perform basic data analysis procedures. • The learner will be able to use R to summarize and graph data, calculate confidence intervals, test hypotheses, assess
UNIT II		
UNIT III		

		goodness-of-fit, and perform linear regression, choose the right method to summarize a dataset, graphically and numerically ,perform basic hypothesis tests on a data set, assess whether different variables are linked, using correlation and regression analysis,
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T.Y.B.Sc.

STATISTICS WITH ELEMENTS OF OPERATIONS RESEARCH AS AN APPLIED COMPONENT.

SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
PAPER I		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be introduced to the advance concepts in probability, to compute probabilities of different probability models, the use of occupancy numbers and the theory of runs.
UNIT II		<ul style="list-style-type: none"> • The learner will be able to use the concept of MGF to derive moments of discrete distributions. The learner will know the use of Trinomial and Multinomial distributions.
UNIT III		<ul style="list-style-type: none"> • The learner will be able to solve different types of problems involving the BVN. • The learner learn to test the significance of population correlation coefficient, he will

UNIT IV		<p>learn to make use of Fisher's z-transformation.</p> <ul style="list-style-type: none"> The learner will be able to compute the distributions of the 1st, nth and rth order statistics and able to apply them to different problems.
PAPER II		<ul style="list-style-type: none"> CREDITS:
UNIT I		<ul style="list-style-type: none"> The learner will get to know the terminology used for statistical inference. Also, learn the properties of good estimator and solve different examples involving discrete and continuous probability distributions. The learner will learn the use of MVUE, CRLB, Fishers information and MVBUE involving the parameters of discrete and continuous probability distributions. The learner will be able to find the point estimates of parameters for standard discrete and continuous distributions. Learner will be able to compute point estimates using Bayes' estimation procedure. also be able to compute confidence interval for parameters of standard discrete and continuous distributions
UNIT II		
UNIT III		
UNIT IV		
PAPER III		<ul style="list-style-type: none"> CREDITS:
UNIT I		<ul style="list-style-type: none"> The learner will be introduced to the concepts of epidemic models and will be able to estimate the value of 'p' for different epidemic model.
UNIT II		

UNIT III		<ul style="list-style-type: none"> • He/She will be introduced to different types of bio-assays. He will learn to estimate the potencies for different assays, compute confidence interval using Fieller's theorem and perform ANOVA for different assays. • The learner will be introduced to the basic concept of clinical trials and will know when and how to perform a clinical trial. • The learner will know the concepts of Bioequivalence of drugs, generic and branded. He/She will learn to estimate PK parameters using 'time vs. concentration' profiles. Also, learn to establish Bioequivalence of generic drugs.
UNIT IV		
Paper IV		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The Learner will able to compute and interpret various mortality functions. • The learner will be able to calculate the present and accumulated values for different types of annuities and also to compute the EMI's for loans. • He /She will be able to describe and understand the various types of life annuities. • He/She will obtain the knowledge of life products and hence will be able to distinguish between different types of assurance policies.
UNIT II		
UNIT III		
UNIT IV		

SEMESTER VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
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PAPER I		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The Learner will able to find PGF's of different discrete probability distributions. • Also, will able to use the knowledge of PGF to compute probabilities for different problems. • He/She will get knowledge of stochastic processes and their applications. • Learner will able to construct new stochastic processes based on various real life restrictions. • On successful completion of the course learner will have a good grasp of basic concepts, techniques and results associated with the elementary theory of Markov processes.
UNIT II		
UNIT III		
UNIT IV		
PAPER II		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be able to derive best test for testing simple null hypothesis against simple alternative hypothesis. • The learner will be able to derive best test for testing simple or null hypothesis against composite alternative hypothesis. • The learner will able to derive test for testing simple hypothesis against simple composite hypothesis without fixed sample size and will able to compare it with usual test with fixed sample size. The learner will able to
UNIT II		
UNIT III		
UNIT IV		

		<p>understand various methods of non-parametric tests and concepts related to the testing of hypothesis.</p> <ul style="list-style-type: none"> • Also, able to obtain the theoretical and practical knowledge on the analysis of non-parametric tests.
PAPER III		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be able to transform data in the form of full rank model and will find estimate of parameter. The learner will be able to compute multiple and partial correlation coefficient and also able to will be able to fit regression planes by the method of least squares. He will gain knowledge of: Interpretation of linear regression models, Relationship between correlation and linear regression, Regression coefficients, Interpretation of interaction terms, The assumptions of linear regression analyses, identify violation of the assumptions and learn possible remedies for the violations. The learner will understand the need of time series and its real life examples. Also able to perform calculations of Simple Exponential Smoothing, Double Exponential Smoothing
UNIT II		
UNIT III		
UNIT IV		
Paper IV		<ul style="list-style-type: none"> • CREDITS: 2
UNIT I		<ul style="list-style-type: none"> • The learner will learn various measures of Mortality, Fertility.

UNIT II		He will able to perform calculations of various measures of Mortality, Fertility.
UNIT III		<ul style="list-style-type: none"> • The learner will learn the concept of reliability, hazard function and its derivation for standard distributions. Also derivation of reliability of series and parallel systems.
UNIT IV		<ul style="list-style-type: none"> • The learner will able to compute reliability, hazard function for standard distributions. Also reliability of series and parallel systems. • He/She will be made aware of necessity of simulation in real life and its applications. He will learn the Monte Carlo Technique of Simulation. • The learner will be able to generate random sample from various standard distributions. • Also, will able to use Monte Carlo Technique of Simulation in real examples. He/she will learn the various available products on insurance. He/She will get knowledge of health insurances and pension products, which they can apply in their real life

T.Y. B. Sc.
APPLIED COMPONENT: ELEMENTS OF OPERATIONS RESEARCH

SEMESTER V

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be able to formulate a linear programming problem (L.P.P.). Learn the Mathematical Formulation: Maximization & Minimization. Concepts of Solution, Feasible Solution, Basic Feasible Solution, Optimal solution. Graphical Solution for problems with two variables. He will be able to solve an LPP using different techniques. He will be introduced to the concept of Integer programming and solve the corresponding problems using the graphical method and the Gomory's Method. • He will know how to deal with the changes which occur when there is • A Variation in the price vector "c". • A Variation in requirement vector "b". • An addition of a new variable to the LPP • He learn the transportation and assignment problems using different methods • He will learn the processing of n jobs 2 / 3 Machines and the processing 2 Jobs through m Machines
UNIT II		
UNIT III		
UNIT IV		

		<ul style="list-style-type: none"> • He will learn to take decisions under certainty, uncertainty and risk. The methods which he will learn are Laplace criterion, Maximax (Minimin) criterion, Maximin (Minimax) criterion, Hurwicz α criterion, Minimax Regret criterion. Decision making under risk: Expected Monetary Value criterion, Expected Opportunity Loss criterion, EPPI, EVPI. • Bayesian Decision rule for Posterior analysis. Decision tree analysis
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SEMESTER VI

COURSE CODE	TITLE	CREDITS AND COURSE OUTCOME
		<ul style="list-style-type: none"> • CREDITS:
UNIT I		<ul style="list-style-type: none"> • The learner will be introduced to the concepts of Inventory Control Problems, Deterministic as well as stochastic. • He/She will learn the theory of Replacement of items that deteriorate with time and value of money (i) remains constant; (ii) Changes with time and Replacement of items that fail completely: Individual replacement and Group replacement policies • He/She will be introduced to game theory and information theory. • He/She will learn different techniques/ methods of
UNIT II		
UNIT III		
UNIT IV		

		<p>simulation and its applications</p> <ul style="list-style-type: none">• to Inventory and Queuing problems.• Basic elements of the Queuing model. Kendalls Notation. Roles of the Poisson and Exponential distributions. Little's formulae and different queueing models.
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