



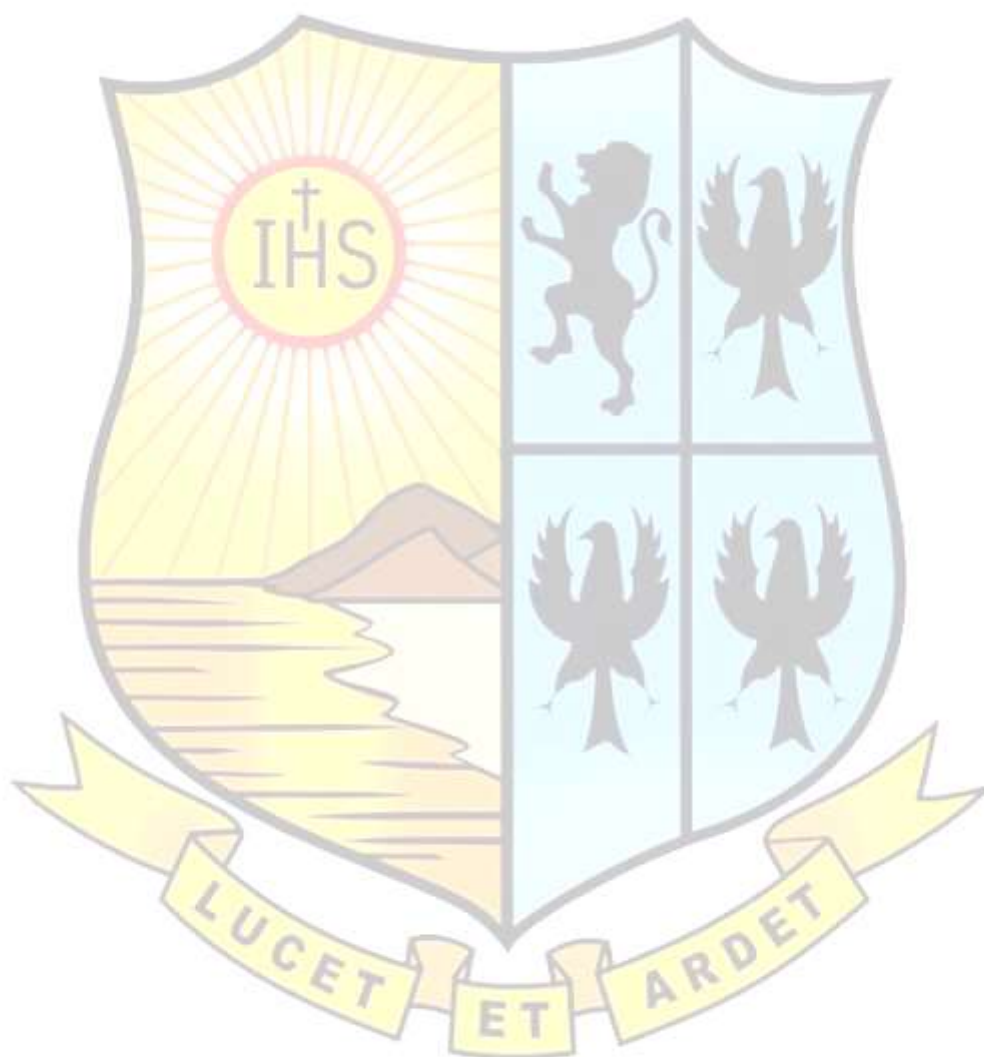
# St Aloysius College (Autonomous), Mangaluru

**Criterion I:** Curricular Aspects

**Metric No.:** 1.1.1

**Year:** 2022-2023

## 1.1.1 Programme Outcomes (POs), Programme Specific outcomes (PSOs), and Course Outcomes (COs) of the Programmes offered by the Institution



**ESTD : 1880**



Department Name:	<b>P 100 - M.A. (Journalism and Mass Communication)</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO 1: Demonstrate an understanding of Conceptual and Theoretical aspects of Journalism and Mass Communication.</p> <p>PO 2: Develop thoughts and ideas for multiple formats including print, audio/visual and digital media.</p> <p>PO 3: Apply analytical and vertical thinking to formulate solutions to contemporary societal issues.</p> <p>PO 4: Inculcate a robust understanding of the practical aspects of writing skills, which forms the basis of all other media.</p> <p>PO 5: Acquire reporting and editing skills for print, audio/visual and digital platforms.</p> <p>PO 6: Demonstrate in-depth knowledge of emerging media platforms such as blogs, microblogs, business networking, digital video, digital photography, augmented / virtual reality.</p> <p>PO 7: Understand and apply concepts of professionalism, ethics and morality in various media platforms.</p> <p>PO 8: Acquire skills to understand and appreciate multicultural issues and evaluate social and ethical role of the media.</p> <p>PO 9: Create industry standards creative campaigns in advertising, public relations, digital media marketing, podcasting etc.</p> <p>PO 10: Analyse working of media and infotainment industries through research based studies and project work.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO 1: Improved communication and media production skills.</p> <p>PSO 2: Adequate theoretical and practical knowledge (technical and application oriented) to be employable in media industry.</p> <p>PSO 3: Ability to demonstrate social concerns, professional ethics and competence to aid in progress and development of the society.</p> <p>PSO 4: Awareness of environmental, developmental, women and gender related aspects of media industry and its impact on society.</p> <p>PSO 5: Ability to analyse, apply and evaluate latest technologies to solve problem in media industry and innovate sustainable solutions for future.</p>	
<b>Semester- I</b>	
<b>Subject and code: PH 101.1 THEORIES OF COMMUNICATION</b>	
<b>Course Outcomes:</b>	
<p>CO 1: Trace the development of theoretical inquiry critically in the field of communication</p> <p>CO 2: Inculcate knowledge of basic theories in the various areas of study within the communication discipline</p> <p>CO 3: Recognize how communication theories apply outside of the classroom and in research</p> <p>CO 4: Analyse the effects mass media on socio-economic fabrics of a society</p> <p>CO 5: Students create their own models of communication</p>	
<b>Subject and code: PH 102.1 ADVANCED REPORTING &amp; EDITING</b>	
<b>Course Outcomes:</b>	
<p>CO 1: Inculcate writing skills for media.</p> <p>CO 2: Demonstrate comprehensive knowledge of journalistic skill of reporting and editing.</p> <p>CO 3: Develop critical and analytical skills while writing for and producing a newspaper.</p>	

CO 4: Daily analysis of newspaper coverage to understand the nuances of print media industry.
<b>Subject and code:PH 103.1 CORPORATE COMMUNICATION AND PUBLIC RELATIONS</b>
<b>Course Outcomes:</b>
CO 1: Understand and demonstrate the use of basic and advanced corporate communication techniques that today's business communication demands CO 2: Apply conceptual thinking in the area of corporate communication and public relations. CO 3: Create strategic corporate communication and public relations campaigns using effective research and development tools and techniques
<b>Subject and code:PS 104.1 DEVELOPMENT OF MEDIA</b>
<b>Course Outcomes:</b>
CO 1: Understand the nuances of communication and its development through multiple communication revolutions CO 2: Develop a comprehensive knowledge of media history in the international, national and regional contexts. CO 3: Make media studies as a relevant field of interest from the historical point of view. CO 4: Assess and evaluate the current trends and challenges faced by the Indian media
<b>Subject and code:PS 105.1 MEDIA LAW AND ETHICS</b>
<b>Course Outcomes:</b>
CO 1: Comprehension and upholding of constitutional values and principles for effective and authentic media profession. CO 2: Develop sincerity and credibility in media profession and inculcate ethical values in any field of media profession CO 3: Acquire comprehensive understanding of media laws and safeguard them in daily profession.
<b>Semester- II</b>
<b>Subject and code: PH 101.2 COMMUNICATION RESEARCH METHODS</b>
<b>Course Outcomes:</b>
CO 1: Inculcate the rigour of research techniques and methods at master's programme level CO 2: Evaluate and utilise statistical tools CO 3: Demonstrate research acumen by creating research proposals/ projects
<b>Subject and code: PH102.2 INTRODUCTION TO AUDIO VISUAL MEDIA</b>
<b>Course Outcomes:</b>
CO 1: Produce communications for different audiences and purposes through audio visual media CO 2: Plan and create in-depth, research-based broadcast pieces CO 3: Create and evaluate broadcast packages with the elements of sound, interviews, videography, and narration (written script).
<b>Subject and code: PH 103.2 FILM STUDIES</b>
<b>Course Outcomes:</b>
CO 1: Impart a basic understanding of film form and technique, including a knowledge of basic film terms.

CO 2: Appreciate and utilize different methodological approaches to film
CO 3: Analyse and write about film and incorporate appropriate film terminology and film scholarship into the writing.
CO 4: Apply narrative principles in students' film works.
<b>Subject and code: PS 104.2 DEVELOPMENT COMMUNICATION</b>
<b>Course Outcomes:</b>
CO 1: Understand and critically evaluate development issues and programmes in India.
CO 2: Comprehend the theories and models related to Development Communication.
CO 3: Inculcate a sense of social concern as media professionals.
CO 4: Develop media tools or messages to propagate sustainable development and social change.
<b>Subject and code: PO 105.2 BROADCAST AND COMMUNICATION (OPEN ELECTIVE)</b>
<b>Course Outcomes:</b>
CO 1: Understand the basics of communication and broadcast media
CO 2: Produce communications for different audiences and purposes through audio visual media using a variety of technologies
CO 3: Comprehend and evaluate broadcast packages with the elements of sound, interviews, videography, and narration (written script).
<b>Subject and code: PO 106.2 TRAVEL JOURNALISM (OPEN ELECTIVE)</b>
<b>Course Outcomes:</b>
CO 1: Explore and understand the concepts and importance of travel journalism
CO 2: Develop technical skills in writing and photography for creating travel blogs
CO 3: Understand travel and tourism trends in the contemporary world
CO 4: Generate interest for tourism and cultural exposure in India
<b>Semester- III</b>
<b>Subject and code: PH101.3a TELEVISION PRODUCTION (SPECIALIZATION SUBJECT)</b>
<b>Course Outcomes:</b>
CO 1: Develop advanced skills and techniques in television production
CO 2: Understand and equip the different stages of pre-production, production and post production in television industry
CO 3: Expedite the role of crew and talents in television production through role-play and real-life industry projects
<b>Subject and code: PH 101.3b DIGITAL JOURNALISM (SPECIALIZATION SUBJECT)</b>
<b>Course Outcomes:</b>
CO 1: Develop creative online content and create reliable platform for them
CO 2: Learn to host and manage a full-fledged blog creating visibility and publicity of their contents
CO 3: Evaluate and implement the web design principles and promote them on different digital platforms
<b>Subject and code: PH 101.3c DIGITAL MEDIA MARKETING (SPECIALIZATION SUBJECT)</b>
<b>Course Outcomes:</b>
CO 1: Understand how and why to use digital marketing for multiple goals within a larger marketing and/or media strategy

CO 2: Evaluate and apply techniques to plan content marketing, develop content for different target audience, and measure its impact.  
CO 3: Develop knowledge of Google Analytics and other marketing analytics tools to help get started with website data analytics.

**Subject and code: PH 102.3a RADIO PRODUCTION (SPECIALISATION SUBJECT)**

**Course Outcomes:**

CO 1: Understand the functioning radio medium.  
CO 2: Develop socially relevant radio programmes.  
CO 3: Create recognizable presence of students on the campus based community radio-Sarang.  
CO 4: Analyse the functioning of different radio stations in the city and during the industrial tours and encourage students on job opportunities in radio programme production

**Subject and code:PH 102.3b KANNADA LANGUAGE PRESS (SPECIALISATION SUBJECT)**

**Course Outcomes:**

CO 1: Discover the relevant role played by journalism in Kannada and develop a taste for it  
CO 2: Create or produce and effective journalistic content and publish them on relevant platforms.  
CO 3: Inculcate the knowledge and journalism skills with the undergraduate students through peer learning.

**Subject and code:PH102.3c CREATIVE STRATEGY & COMMUNICATION (SPECIALISATION SUBJECT)**

**Course Outcomes:**

CO 1: Inculcate knowledge about the theoretical foundations of creative strategy in advertising and marketing communications.  
CO 2: Exposure to the issues and concerns in creative strategy and research.  
CO 3: Identify and evaluate key concepts within the professional and academic fields of modern-day creative strategy and communication.

**Subject and code: PH 103.3 MARKETING COMMUNICATION AND ADVERTISING**

**Course Outcomes:**

CO 1: Inculcate a working knowledge and knowhow about marketing communications strategies and techniques  
CO 2: Develop marketing communication strategies along with planning and implementation  
CO 3: Evolve ability to solve real marketing communication problems by using scientific methods and procedures

**Subject and code: PS 105.3 ENVIRONMENT AND MEDIA**

**Course Outcomes:**

CO 1: Develop a comprehensive knowledge with regard to environment issues and programmes across the world.  
CO 2: Learn about environmentalists and get into environmental advocacy through different media fields.  
CO 3: Develop a keen eye for current environment trends and news and respond to them effectively  
CO 4: Organise environmental media campaigns on different media platforms.

<b>Subject and code: PH 104.3 MEDIA INTERNSHIP</b>
<b>Course Outcomes:</b>
<p>Media internship is a 6-week compulsory exercise. The students are expected to join any media organization and have a first-hand experience of working in the field. They are expected to keep a record of all the work they undertake.</p> <p>A certificate of completion of the 6-week internship must be obtained from the concerned media organization. Students are expected to update on a weekly basis to the concerned faculty about their progress.</p> <p>The internship must be completed before the end of third semester. An assessment and evaluation of the internship will be conducted to award credits. Internship does not have any academic-related assessment.</p>
<b>Subject and code: PO 106.3 FILM APPRECIATION (OPEN ELECTIVE)</b>
<b>Course Outcomes:</b>
<p>CO 1: Learn various components of film and film making and appreciate them from a critical point of view</p> <p>CO 2: Develop a hands-on knowledge in writing film scripts and compare them with reviewed films</p> <p>CO 3: Identify different aspects of films like – mise-en-scene and film making techniques in preproduction, production and post-production period.</p>
<b>Subject and code: PO 107.3 GENDER AND MEDIA (OPEN ELECTIVE)</b>
<b>Course Outcomes:</b>
<p>CO 1: Understand gender issues prevalent in contemporary times.</p> <p>CO 2: Analyse the portrayal of women and the third gender or queer perspectives in mainstream media.</p> <p>CO 3: Evaluate the mainstream media's coverage of gender issues through multifaceted frameworks.</p> <p>CO 4: Apply the knowledge gained in the course to examine real-life issues outside of the classroom activity.</p>
<b>Semester- IV</b>
<b>Subject and code: PH 101.4 DISSERTATION</b>
<b>Course Outcomes:</b>
<p>Objectives of the Dissertation:</p> <p>The main objective of the Dissertation is to give practical exposure to the students in the field of their study and provide industry-institution interaction. The other objectives are as follows;</p> <p>Students will be able to develop research interest and culture in their respective field of study</p> <p>Students explore the social relevance and application of their respective subject</p> <p>It provides practical knowledge and exposure in their studied area</p> <p>It enables the students to make in depth study of the particular issue and explore solution to the problems the society facing in the field of journalism and mass communication</p>
<b>Subject and code: PH 102.4a ONLINE AUDIO/VISUAL PRODUCTION</b>
<b>Course Outcomes:</b>
<p>CO 1: Discover the research methods utilized in gathering data for developing and evaluating online broadcasting strategy</p> <p>CO 2: Evaluate and analyse audio and video techniques to enhance online productions.</p> <p>CO 3: Develop an awareness and appreciation of ethical pitfalls of online broadcasting.</p>

<b>Subject and code: PH102.4b MAGAZINE JOURNALISM (SPECIALIZATION)</b>	
<b>Course Outcomes:</b>	
CO 1: Identify and apply the principles of graphic design to magazines. CO 2: Develop a correlation between editorial content and visual presentation specific to magazines CO 3: Identify stories that lend themselves to different kind of presentations, including photos, audio, video and infographics.	
<b>Subject and code: PH 102.4c INSTRUCTIONAL DESIGNING AND CONTENT WRITING</b>	
<b>Course Outcomes:</b>	
CO 1: Evaluate various technology skills with application of learning theory to maximize the effectiveness of education. CO 2: Analyse diverse models of instructional design and content writing best practices CO 3: Create effective business and technical content through related content writing and techniques.	
<b>Subject and code:PROJECT</b>	
<b>Course Outcomes:</b>	
CO 1: Develop industry standard projects in the field of student's chosen field of specialization CO 2: Understand how to contribute to society's progress and development through practical implication of media concepts. CO 3: Inculcate crucial industry specific attitudes like project management, time management and stress management	
<b>Subject and code: PS 104.4 MEDIA AND CULTURE STUDIES</b>	
<b>Course Outcomes:</b>	
CO 1: Develop a critical perspective towards culture and hegemony. CO 2: Evaluate the relationship between power and media, which promotes cultural traits in society CO 3: Analyze the relationship between visual culture and global capitalism CO 4: Develop skills to carry out cultural analysis of media	
<b>Subject and code: PS 105.4 POLITICAL COMMUNICATION</b>	
<b>Course Outcomes:</b>	
CO 1: Evaluate the key concepts and theories in political communication CO 2: Develop knowledge of practical aspects and paradigms of political communication science CO 3: Analyse mediatization of politics in elections, campaigns and how media used to achieve policy goals.	

<b>Department Name:</b>	<b>P 110 M.A. (Economics)</b>
<b>PROGRAMME OUTCOMES</b>	
PO 1: To develop an understanding about various concepts and principles in Economics. PO 2: To be able to describe the working of the economy both domestic and international. PO 3: To enable the students to recognize the practical possibilities of economic theory in real life. PO 4: To analyses the various sectors and its performance in the development process. PO 5: To create awareness on the inter-linkages between the political system and economic theories.	

PO 6: To assess the impact of various policies on the welfare of the community.  
 PO 7: To ensure the application of the economic theories to facilitate sustainable human life.  
 PO 8: To develop skills to have an orientation to do fruitful research in the discipline.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO 1: To prepare the students with a laborious and broad understanding of the fundamentals of economics with various aspects of consumer behaviour, demand analysis, production theory, costs, theory of traditional markets and equilibrium of the firm. This will enable the students to take decision in the context of market interdependence, complexity, uncertainty and informational asymmetry.

PSO 2: To cover all major theories and models dealing with the issues pertaining to economic growth and development where the learners will be able to realize the nature of the deficiencies of developing nations, need for sustainable growth, reconstruction & development and to suggest policy measures to rectify them and also to explore new avenues of growth.

PSO 3: The extremes of poverty and wealth will be adequately addressed through a comprehensive economic analysis of the public sector which empowers the student to understand and analyse public policies and problems with an insightful vision of fiscal institutions which underline budgetary policies in general and Indian experience in particular.

PSO 4: To provide adequate knowledge of statistical techniques to analyse economic problems through the development of research skills includes, framing testable hypotheses, selection of precise statistical tests, locate appropriate data for testing hypotheses, reject/accept hypotheses correctly, evaluates results, and write up the research findings.

PSO 5: To develop a vision to achieve a mission of attaining a sustainable society by applying theoretical and empirical analysis of sources of and solutions to environmental problems, with application to local pollution challenges and global environmental issues such as climate change.

PSO 6: To make the students aware of the quantitative and the qualitative aspects and characteristics of the population through various demographic techniques, importance of population in economic development, various theories that explains the growth of population and research directions in the field of population studies in a country.

PSO 7: To train the students on latest theoretical developments in macroeconomics for empirical analysis, integrate method and technique to evaluate policy measures, understanding developments in labour market and gauge the trade-off in the deployment of resources to alternative ends.

PSO 8: To prepare the students to understand and respond to economic issues and forces of Globalisation, free flow of trade in goods, governance of services and capital and it's rapidly changing scope and nature in international business and trade.

#### **Semester- I**

**Subject and code: PH 111.1: MICRO ECONOMIC ANALYSIS**

#### **Course Outcomes:**

CO 1: The student gets equipped with the knowledge and skill in effective decision making under uncertain market situations.

CO 2: Understand the theories related to different market forms.

CO 3: Able to understand the functioning of the varied markets.

CO 4: The student acquires skills in allocating scarce resources among alternative uses.

CO 5: Able to make decisions in varied economic situations.

CO 6: Able to critical evaluate the functioning of the market.

**Subject and code: PH 112.1 DEVELOPMENT ECONOMICS**

**Course Outcomes:**

CO 1: Students will be able to understand the use of economic analysis in addressing important issues of developing countries.

CO 2: To understand how the presence of externalities could influence the growth process let us focus on learning by doing externality. There are a number of firms in the economy and each uses the same production technology with diminishing returns.

CO 3: Understand the role of agriculture, industry, and trade in the development process of the less developed countries.

CO 4: Understand the extent to which economic theories may be helpful in the design of development policies in the less developed countries.

CO 5: Learners should understand the need for sustainable growth, reconstruction and development. As the inequalities of the past and present - especially the extremes of poverty and wealth - cannot be adequately addressed by conventional socio-economic policies alone, other innovations can also be explored.

CO 6: Use theories (models) to analyse real and hypothetical economic circumstances and to derive policy solutions to the problems posed in these circumstances.

**Subject and code: PH 113.1 STATISTICAL TECHNIQUES FOR ECONOMIC ANALYSIS**

**Course Outcomes:**

COURSE OUTCOME:

CO 1: The students will be able to describe and discuss the key terminology, concepts used in statistical techniques for economic analysis.

CO 2: The students can understand the methods used for analysis and the uses and limitations of statistical analysis including a discussion of advantages, disadvantages, and necessary assumptions.

CO 3: To derive the results of the statistical techniques and economic interpretation of those results.

CO 4: To understand and critically discuss the issues surrounding sampling and significance

CO 5: It helps to develop research skills including frame testable hypotheses, select correct statistical tests, locate appropriate data for testing hypotheses, reject/accept hypotheses correctly, analyzes results, and It also contributes to making appropriate decisions in the light of the researcher's findings.

CO 6: To measure the effect of change and discover techniques to improve decision-making process

**Subject and code: PS 114.1 ENVIRONMENTAL ECONOMICS**

**Course Outcomes:**

CO 1: To understand the relationship between environment and economic growth; how economic growth affects environment; how environment development programmes affect economic growth; the tradeoff.

CO 2: To create basic ideas of the cost of environmental growth and sustainable policy approach to prevent environmental degradation, green accounting, methods of environmental valuation, Environmental concerns, environmental education, environmental awareness, environmental laws, environmental hazards and economics of recycling.

CO 3: To enable the student to focus on economic effects of environmental policies around the world. It is a science emphasis on natural resources and its efficient allocation, management with alternatives, and environmental indemnities like air, water soil pollution, solid waste management, and global warming etc.

CO 4: Explain how something can be both “environmentally destructive” and “economically optimal”; and how something can be environmentally beneficial and economically suboptimal.

CO 5: Helps to examine the relationship between the economy and the environment in the context many activities started by environmental economists, activists and nature lovers.

CO 6: Identify factors to find solutions to environment problems that are relevant to protect the welfare of the people.

**Subject and code: PS 115.1 PRINCIPLES OF BANKING**

**Course Outcomes:**

CO 1: The students ‘will get the knowledge of the structure and role of banking in an economy.

CO 2: To develop skills in students in understanding the functioning of various banking activities

CO 3: To gain the up-to-date knowledge regarding the banking terminologies.

CO 4: To categorize and analyze banker – customer relationship

CO 5: Able to understand the payment and collection procedure of negotiable instruments

CO 6: Able to understand the facilities available and utilization of the same at different circumstances.

**Subject and code: PS 116.1 ECONOMICS OF DEMOGRAPHY**

**Course Outcomes:**

CO 1: Students are able to explore population changes over time; elements of demography; child survival and mortality; family and households and demographic change.

CO 2: Understand the demography of social and economic inequality, role of women, urbanization, migration and fertility.

CO 3: Examine world demographic patterns, synthesizing the data and issues surrounding the importance of population to public health.

CO 4: Able to critically evaluate the issues related to demography.

CO 5: Comprehend the basic concepts and definitions in demography and identify the various sources of data in demography.

CO 6: Prepare the students for variety of challenging careers through innovation in teaching and research.

**Subject and code: PS 117.1 INDUSTRIAL ECONOMICS**

**Course Outcomes:**

CO 1: The student gets the skill of efficient and economic use of scarce resources.

CO 2: Understand the various theories related to wages, labour, firm etc.

CO 3: The student gets equipped with the knowledge and skill in effective decision making under uncertain market situations.

CO 4: Understand the role of unions and its bargaining powers.

CO 5: Critically evaluate the issues related to labour and firms.

CO 6: The student acquires skills in allocating scarce resources among alternative uses.
<b>Semester- II</b>
<b>Subject and code: PH 111.2: MACRO ECONOMIC ANALYSIS</b>
<b>Course Outcomes:</b>
CO 1: Explain the functioning of various sectors of the economy. CO 2: Develop an understanding of the various theories related to macro variables. CO 3: Demonstrate an understanding of the macroeconomic implications of decisions made by diverse economic entities. CO 4: Able to comprehend the link of various sectors in an economy. CO 5: Integrate theoretical knowledge to evaluate policy measures CO 6: Analyse trade-off in the deployment of resources to alternative ends.
<b>Subject and code: PH 112.2 MATHEMATICAL TECHNIQUES FOR ECONOMIC</b>
<b>Course Outcomes:</b>
CO1: To familiarize the students with the mathematical economics terminologies CO2: Able to build models by expressing words in symbols, numbers and equations CO3: Able to apply economic theory and methods to selected real world economic problems. CO4: Able to demonstrate analytical and critical thinking skills and to apply and interpret quantitative, qualitative and graphical information in a problem-solving context. CO5: To equip students with the flexibility and skills necessary to succeed in a constantly changing environment. CO6: A new dimension of scientific, logical and critical thinking, which will assist the mind to solve personal, professional and social problems and guide the students to take wise decisions.
<b>Subject and code: PH 113.2 INTERNATIONAL ECONOMICS</b>
<b>Course Outcomes:</b>
CO 1: Identify and analyse different theoretical models of international economics in light of 'real world' situations. CO 2: Understand major issues in international finance, be able to deal with them analytically, and identify possible resolutions for those issues. CO 3: Analyse the determinants, patterns and effects of international trade within a general equilibrium framework, where the interrelationships amongst product and factor markets in an economy are explicitly taken into consideration. CO 4: Distinguish between the efficiency implications and distributional consequences of trade and trade policy. CO 5: Discuss and explain specific policy issues such as 'environmentalism as protectionism'; international dumping; the choice of exchange rate regime; the desirability of free capital flows. CO 6: This course advances understanding of economics across business and the public sector with critical skills and competencies.
<b>Subject and code: PS 114.2 FINANCIAL INSTITUTIONS AND MARKETS</b>
<b>Course Outcomes:</b>
CO1: To outline the basics of Indian financial systems and its components CO2: To provide students with an introduction to the theory and practice of financial instruments.

CO3: Explain financial institutions and how firms obtain funds in the financial markets.  
 CO4: To analyze and evaluate financial markets, how securities are traded, mutual funds, investment companies, and investor behavior.  
 CO5: To explain how the financial services component industries (insurance, banking, securities, real estate and financial planning) interact.  
 CO6: Understand the importance of the financial sector in directing the use of scarce capital and able to analyze the various financial sector reforms in India.

**Subject and code: PS 115.2 RESEARCH METHODOLOGY AND ETHICS**

**Course Outcomes:**

CO 1: Students can develop testable hypotheses, differentiate research design and/or statistics, evaluate aptness of research conclusions, and generalize them appropriately.  
 CO 2: Students can design and conduct quantitative or qualitative research studies in laboratory or field settings. Students use research data to formulate or evaluate new research questions, using reason and persuasion in a logical argument.  
 Students can summarize and evaluate a body of research including primary literature, and  
 CO 3: can compare psychology's methods with other disciplines' methods.  
 CO 4: Demonstrate a logical argument, analyse and interpret data and evaluate alternative perspectives on the basis of objective reasoning. Communicate and present complex arguments in oral and written form with clarity and succinctness.  
 CO 5: More awareness on Intellectual property Rights and Patents.  
 CO 6: Able to write original research articles following ethical guidelines and practices in conducting the research and publication of papers.

**Subject and code: PS 116.2 AGRICULTURAL ECONOMICS**

**Course Outcomes:**

CO 1: Able to understand the theories of agricultural economics.  
 CO 2: Gain knowledge in the importance of the primary sector in Indian economy.  
 CO 3: Write texts in various forms, with an identified purpose, that respond to specific audience CO 3: needs, incorporate research or existing knowledge, and use applicable documentation and appropriate conventions of format and structure.  
 CO 4: Capable of using mathematical, computational, statistical or formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences and determine reasonableness.  
 CO 5: Students will be able to identify an appropriate theoretical framework, a suitable analytical method, and undertake an informed empirical analysis.  
 CO 6: Students will have a good general understanding of agricultural production functions, cost and profit functions, math programming models, and non-optimizing simulation models.

**Subject and code: PS 117.2 ECONOMICS OF HUMAN RESOURCE DEVELOPMENT**

**Course Outcomes:**

CO 1: Knowledge of Industrial Organizational Behavior, Development, & Change Strategies: Given an organization's target for development or change, analyze organizational and work behavior in relation to the target, evaluate the need for and influences of change on the organization and organizational members, and apply appropriate models, theories, and principles to facilitate healthy change and development.  
 CO 2: Competency in Diversity as it Applies to Industrial Organizational Practices: Analyze and evaluate how diversity influences industrial organizational issues, and develop change

strategies that demonstrate an appreciation of how diversity influences individuals and groups within the organization.

CO 3: Students may obtain frameworks and tools to effectively analyze and approach various organizational situations.

CO 4: Develop an organisational culture in which superior-subordinate relationships, teamwork and

association among sub-units are solid and contribute to the proficient wellbeing, motivation and pride of employees.

CO 5: Obtain or refine competences essential to achieve numerous roles connected with students current or anticipated impending roles.

CO 6: The study of human resource development emphasis on efficiency of individuals as productivity in itself is an important organisational and personal goal.

**Subject and code: PO 118.2 BANKING AND FINANCE**

**Course Outcomes:**

CO1: To understand the Origin and the growth of the Indian Banking System.

CO2: To elucidate the broad functions of various types of banks

CO3: To evaluate the performance of the developmental banking institutions

CO4: Able to demonstrate an awareness of the current structure and regulation of the Indian financial services sector.

CO5: Discuss the impact of government policy and regulations on the banking sector.

CO6: To understand the working of development financial institutions in the development of rural sector, farmers, industries and financial market.

**Semester- III**

**Subject and code:PH 111.3: MONETARY ECONOMICS**

**Course Outcomes:**

CO 1: Develops the skill to know the interdependence and complexity of the economic system.

CO 2: Skill is developed to understand the monetary policy and its working in the system as a stabiliser.

CO 3: Able to understand the various theory related to monetary economics.

CO 4: Recognise the interrelation of the money and product market in the economy.

CO 5: Understand the working of the monetary policies in the stabilization process.

CO 6: Critically evaluate the policies related to stabilising the economy.

**Subject and code:PH 112.3 ECONOMETRICS**

**Course Outcomes:**

1: Able to explain the relation between economic theory and Econometrics.

CO 2: Develop the capacity to understand the various tools in Econometrics.

CO 3: Ability to understand the usefulness of econometric tools.

CO 4: Skills developed to analyse economic problems using econometric tools.

CO 5: Analyse the problems associated with econometric models.

**Subject and code: PS 113.3 HEALTH ECONOMICS**

**Course Outcomes:**

CO 1: Helps to analyse the importance of health as a major determinant of economic growth.

CO 2: Gain a deeper understanding of evaluating and creating dynamic and flexible strategies for healthcare delivery.

CO 3: Have competence to apply economic concepts and models to the fields of demand for health, demand for health services, demand for health insurance, provision of health insurance and provision of health care.

CO 4: Be able to design public drives in preventive medicine and apply social marketing techniques, both addressing public will and individual behaviors.

CO 5: Provide useful insights into the delivery of health care, it's economic evaluation that provides the bulk of health economists' work and is of most relevance to managers and practitioners.

CO 6: The course helps to understand the increasing importance of precision medicine and real-world situation that impacting medical affairs professionals, medical science liaisons, and have to be able to have meaningful conversations with healthcare providers about health economics concepts. Comprehend the structures of marketing management in healthcare organisations, and the steps through which marketing helps an organisation to identify the needs of and focus on its customers.

**Subject and code:PS 114.3 LABOUR ECONOMICS**

**Course Outcomes:**

CO 1: By the end of this course, students will be able to understand the basic theories of labour markets

CO 2: Able to understand the labour market policy outcomes.

CO 3: Able to analyse how theoretical understanding of the labour market and empirical approaches to the labour markets are related.

CO 4: Able to identify the role of government policies in labour welfare.

CO 5: Show understanding of commonly used data and methods in applied labour market research.

CO 6: Demonstrate the ability to acquire and convey content in international scientific literature in the field of research.

**Subject and code:PS 115.3 DEVELOPMENT BANKING**

**Course Outcomes:**

CO1: To understand the growth and structure of development banking Institutions in India

CO2: To analyse the functions of modern banking financial services and its importance

CO3: To enable the students get familiarized with Mutual Funds

CO4: To acquaint the students in respect to the investment decisions related to Derivative market

CO5: To understand the dynamics of capital market, money market and to learn the importance to be updated on the developments of the banking sector and practice the same.

CO6: Understanding the working of development financial institutions in the development of rural sector, farmers, industries and financial market.

**Subject and code:PS 116.3 ENERGY ECONOMICS**

**Course Outcomes:**

CO 1: Understand basic economic concepts that underlay energy production and end use.

CO 2: Describe the sources of energy and the scarcity associate with it.

CO 3: Able to identify how local, regional, and global institutions affect energy markets and prices.  
 CO 4: Apply the uses of energy resources efficiently in alternative uses.  
 CO 5: Become familiar with historical and contemporary public policy issues related to energy globally.  
 CO 6: Be able to apply this knowledge to analysis of specific energy industries and policy questions.

**Subject and code:PO 117.3 CONTEMPORARY INDIAN ECONOMY**

**Course Outcomes:**

CO 1: Students are able to have a critical understanding of the Indian economy so that they may be able to engage meaningfully in debates regarding the country's economy  
 CO 2: Understand the formulation of economic policies and its analysis.  
 CO 3: Able to comprehend the broad contours like the status, issues and policies of the Indian economy at the aggregate as well as sectoral levels.  
 CO 4: Describe the experiences in the pre as well as post reform years, keeping the colonial experience at the background.  
 CO 5: Have a general understanding of the corporate, geo-political, cultural and social factors that define the Indian economic, cultural and technological landscape at the present time.  
 CO 6: Critical understanding of the global policies influencing Indian economy.

**Semester-IV**

**Subject and code:PH 111.4 PUBLIC ECONOMICS**

**Course Outcomes:**

CO 1: Perform economic policy analysis by applying microeconomic principles and theories  
 CO 2: Theoretical and practical expertise on a selected field of Public Economics and competence in applying advanced economic theory and methods in investigating issues concerning Public Economics.  
 CO 3: Use models to describe economic phenomena; analyze and make predictions about the impact of government intervention and changing market conditions on consumer and producer behavior and well-being.  
 CO 4: Employ economic theory, broadly defined, to provide an original analysis of current or historical events, to analyze social problems, and evaluate alternative public policy choices.  
 CO 5: Be aware of the complex nature of public finance reform – the political dimension, change management, capacity development, the constraining dimension of functional linkage. Be able to question the nature of relevance of some popularly promoted public finance reforms – such as performance budgeting, budgeting by objectives, activity-based budgeting.  
 CO 6: Understand the idea of sequencing in public finance reform and improvement, and that any sequencing must be adapted to the situation in any country; identify why sequencing is important because "things" take time and "things" should take time.

**Subject and code:PH 112.4: INDIAN ECONOMY**

**Course Outcomes:**

CO 1: Students are able to have a critical understanding of the Indian economy so that they may be able to engage meaningfully in debates regarding the country's economy

CO 2: Understand the formulation of economic policies and its analysis.  
 CO 3: Able to comprehend the broad contours like the status, issues and policies of the Indian economy at the aggregate as well as sectoral levels.  
 CO 4: Describe the experiences in the pre as well as post reform years, keeping the colonial experience at the background.  
 CO 5: Have a general understanding of the corporate, geo-political, cultural and social factors that define the Indian economic, cultural and technological landscape at the present time.  
 CO 6: Critical understanding of the global policies influencing Indian economy.

**Subject and code: PS 114.4 ECONOMICS OF INSURANCE**

**Course Outcomes:**

CO1: To understand the insurance terminology and contract features.  
 CO2- To understand the concept of insurance and its evolution  
 CO3: To evaluate client insurance and risk management needs.  
 CO4- To understand the different needs of customers on insurance products  
 CO5: To Identify and explain features of private and public insurance available to meet each identified need.  
 CO6: To understand the business operations and market condition in Insurance Companies

**Subject and code: PS 115. 4: OPERATIONS RESEARCH FOR ECONOMIC ANALYSIS**

**Course Outcomes:**

CO 1: Able to understand the usefulness of operations research in solving economic problems.  
 CO 2: Describe the various techniques of operations research.  
 CO 3: Students are equipped to use the tools like transportation table, assignment to analyse and solve problems relating to cost, marketing, production etc.  
 CO 4: Be able to understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type.  
 CO 5: Able to prioritise the specific use of the techniques of operations research.  
 CO 6: Be able to design new simple models.

**Subject and code: PS 116.4 INTERNATIONAL FINANCE**

**Course Outcomes:**

CO 1: Familiarity with financial concepts and analytical techniques and introduce their application to international transactions.  
 CO 2: Ability to relate concepts and knowledge in different areas which support the learner to solve problems and help to take decisions in complex as well as changing environments.  
 CO 3: Provide an in-depth understanding of the process and techniques used to make international investment decisions.  
 CO 4: Ability to analyse the causes of historical exchange rate movements and apply the models to solve the wide range of current issues in international finance.  
 CO 5: Review the problems of dealing in foreign currency and the advantages and disadvantages of overseas funding.  
 CO 6: Obtain a good working knowledge of the crucial questions adjacent to international capital flows, FDI, foreign exchange rate determination and exposure management,

international capital markets and institutions, and develop an understanding of the working of the financial management of a multinational firm.
<b>Subject and code: PS 117.4 RURAL BANKING</b>
<b>Course Outcomes:</b>
CO 1: Understand the working of banks in rural areas. CO 2: Students get the knowledge of the credit structure in the rural economy. CO 3: Helps to understand the various problems of the rural economy without adequate credit facility. CO 4: Students are able to grasp the importance of various sources of rural credit in the development of an economy. CO 5: Assess the role of rural economy in the development of a nation. CO 6: Analyse the usefulness of effective policy measure in improving rural credit.

<b>Department Name:</b>	<b>P 120 M.A(English)</b>
<b>PROGRAMME OUTCOMES</b>	
PO- 1 Greatly enhance their foundational knowledge about the history, literature, gender, culture, race and other perspectives of comprehending human experience. PO-2 Independently enquire into the pre-existing knowledge sources and assess them. PO-3 Efficiently take up competitive exams, interviews and other similar situations to excel. PO-4 Design and undertake individual research which will contribute significantly to the future ideological and societal developments. PO -5 Analyze and articulate the range of position that challenges the prevailing social, political, economic, ontological and ethical framework. PO-6 Integrate various theories and methodologies with social and environmental Consciousness	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
PSO – 1 Create a social awareness in terms of society, culture, ethnicity, ecology and gender backgrounds of literature. PSO - 2 Utilize the different critical approaches and demonstrate them in the prescribed texts. PSO -3 Develop skills of research through interpretation, critical thinking and clear writing. PSO -4 Compile their research by applying research methodology. PSO – 5 Evaluate teaching-learning process through various teaching aids. PSO – 6 Identify the significance of internationally acclaimed works through the writings of highly celebrated writers including translated versions. PSO - 7 Recognize the significance of their social and professional responsibilities as citizens with integrity. PSO - 8 Develop analytical, research-oriented and organizational skills CO (Course Outcomes)	
<b>Semester- I</b>	
<b>Subject and code: H 121.1 - Paper I: British Literature I (Medieval Literature to Neoclassical Literature)</b>	
<b>Course Outcomes:</b>	
CO 1: Enabling the students to understand the beginnings of English Literature CO-2: To gain an in-depth knowledge about the age and authors CO 3: To gauge how the era began to formulate the notions of England and English	

CO-4: Express the socio-cultural and religious practices of British people during that period
<b>Subject and code: PH 122.1 - Paper II: Literary Criticism</b>
<b>Course Outcomes:</b>
CO 1: To introduce the students to the concept of Literary Criticism CO 2: To create a working knowledge of the different types of 'criticisms' CO 3: Understanding the 'establishing' of the canon CO 4: To be able to apply some criticism to the texts
<b>Subject and code: PH 123.1 - Paper III: Research Methodology and Ethics</b>
<b>Course Outcomes:</b>
CO 1: To introduce the students to the basics of doing research. CO 2: The paper will focus on how to use the correctly write and document the thesis CO 3: Give information various approaches to studying and doing research in literature CO 4: Will guide the students to do ethical and original research
<b>Subject and code: PS 124.1 - Paper IV: Modern Indian Theatre</b>
<b>Course Outcomes:</b>
CO 1: To introduce the students to origins of theatre in in India CO 2: To help students to critically learn to evaluate and read plays CO 3: Understand the contributions made by the theaters to Indian art and culture CO 4: To be made familiar with the various techniques employed in plays
<b>Subject and code: PS 125.1 - Paper V: Children's Literature</b>
<b>Course Outcomes:</b>
CO 1: Introduce the students to the genre as a serious academic activity CO 2: Highlight the way in how a children's text can be 'read' CO 3: Discuss the complexities of the genre, Children's Literature CO 4: Examine the role and popularity of the authors of these texts
<b>Subject and code: PS 126.1- Paper VI: Linguistics and Semiotics</b>
<b>Course Outcomes:</b>
CO 1: equip the students with the various techniques of phonology, morphology, syntax CO 2: Understand and analyse the relationship between language and society CO 3: Analyse the nuances associated with study of semiotics CO 4: Practical experience in reading and analyzing signs
<b>Subject and code: PS 127.1 - Paper VII: European Literature</b>
<b>Course Outcomes:</b>
CO 1: To help students read texts in the wider context of European history. CO 2: Contextualize the text and read it in relation to the immediate present. CO 3: Understand the contributions of the authors to European Art and Culture CO 4: Understand the nuances of various movements associated with European Literature
<b>Subject and code: PS 128.1 - Paper VIII: Ecocriticism</b>
<b>Course Outcomes:</b>
CO 1: Introduce the students to the genre of Ecocriticism CO 2: Examine the relation between environment and humanity CO 3: Analyse the texts to enable a deeper understanding of the complexities of our environment and its protection CO 4: Understand related theoretical frameworks like ecofeminism, eco aesthetics, so on

<b>Subject and code: PS 129.1 - Paper IX: Literature from Canada, Australia and New Zealand</b>
<b>Course Outcomes:</b>
CO 1: Understand the contribution of Canada, Australia and New Zealand to Literature in English CO 2: Master the major literary trends in these countries CO 3: Analyse the ethnic and cultural diversity present in these countries CO 4: Examine the art form of these place's Literature
<b>Semester- II</b>
<b>Subject and code: PH 121.2 - Paper X British Literature II (The Romantics and the Victorians)</b>
<b>Course Outcomes:</b>
CO 1: To introduce the Romantic and Victorian eras to the students CO 2: To critically analyse the texts of the authors of the time CO 3: To gauge the rise of industries and technology in the socio-cultural context CO 4: Comprehend Britain's growing domination around the world
<b>Subject and code: PH 122.2 - Paper XI: Literary Theories</b>
<b>Course Outcomes:</b>
CO 1: Introduce the students to the concept of "Literary Theories" CO 2: Develop a thorough understanding of the texts prescribed for study CO 3: Enhance their critical skills by learning to read and interpret texts CO 4: Application of relevant theories to the concerned texts
<b>Subject and code: PH 123.2 - Paper XII: Indian Writing in English I</b>
<b>Course Outcomes:</b>
CO 1: Understand the origins of the term, Indian Writing in English CO 2: Critically examine the writers in the early days of Indian Writing in English CO 3: Examine the term Indian and the nuances associated with it CO 4: Evaluate the role of English in the context of the Indian subcontinent
<b>Subject and code: PS 124.2 - Paper XIII: Film Studies</b>
<b>Course Outcomes:</b>
CO 1: To learn and have a greater understanding on how to read and analyze film CO 2: To familiarize major film theories and movements CO 3: To understand major concerns in Indian Films CO 4: To study the cultures as represented in Kannada films on the region Dakshina Kannada
<b>Subject and code: PS 125.2 - Paper XIV: Twentieth Century Asian and Middle Eastern Fiction</b>
<b>Course Outcomes:</b>
CO 1: Introduce the students to the canon fiction of Asia and the Middle East. CO 2: Examine the role played by these writers in the literary scenario of their country CO 3: Understand the individual countries culture and ideology CO 4: Understand the diversity of cultures, ideologies and beliefs that are present in the world.
<b>Subject and code: PS 126.2 - Paper XV: Fantasy Literature</b>
<b>Course Outcomes:</b>
CO 1: Examine the origins of the, genre Fantasy Literature

CO 2: Evaluate the role played by the authors in the development of the genre CO 3: Understand and evaluate the various worlds of fantasy CO 4: Understand and evaluate Fantasy as a serious academic pursuit
<b>Subject and code:PS 127.2 - Paper XVI: Literature from Africa and the Caribbean Islands</b>
<b>Course Outcomes:</b>
CO 1: Introduce the students to the Literature from Africa and the Caribbean Islands CO 2: Evaluate the cultural diversities present in the texts prescribed for study CO 3: Understand the histories of these people CO 4: Examine the texts from the perspectives of colonisation and slavery
<b>Subject and code:PO 128.2 -Paper XVII: CBCS – Reading Literature</b>
<b>Course Outcomes:</b>
CO 1: Introduce students to the various genres in literature CO 2: Evaluate the concept of the text, the work and the canon CO 3: Help students develop the basic skills in reading the texts CO 4: Employ Reading strategies to analyse the text
<b>Semester- III</b>
<b>Subject and code: PH 121.3- Paper XVIII: British Literature III (Modernism to Postmodernism)</b>
<b>Course Outcomes:</b>
CO 1: Introduction of the terms Modernism and Postmodernism CO 2: Evaluate the devastating histories of the time and its impact CO 3: Examine the rise of new movements in art CO 4: Evaluate the texts prescribed for study on the basis of the socio-cultural circumstances
<b>Subject and code:PH 122.3- Paper XIX: English Language Teaching</b>
<b>Course Outcomes:</b>
CO 1: Familiarize the learners with the basics of language teaching CO 2: Make the learners understand the basics of language learning CO 3: Help the students in learning how testing is done for English as a discipline CO 4: Make them understand the process of generating learning material
<b>Subject and code: PH 123.3-Paper XX: American Literature I</b>
<b>Course Outcomes:</b>
CO 1: Identify and recognize the modes and motifs of American Literature CO 2: Compare, contrast and co-relate American literature with other national and regional literatures CO 3: Evaluate the history to understand the formation of the American State CO 4: Evaluate the texts to understand the essence of American Culture
<b>Subject and code:PH 124.4-Paper XXI: Indian Writing in English II</b>
<b>Course Outcomes:</b>
CO 1: To understand the latter trends in Indian Writing in English CO 2: To examine the formation of India as an independent state CO 3: Evaluate the continued role played by the English in the Indian Subcontinent CO 4: Discuss the role played by the authors in the final development of the genre
<b>Subject and code:PS 125.3-Paper XXII: Science Fiction</b>
<b>Course Outcomes:</b>
CO 1: Examine the origins of the, genre Science Fiction

CO 2: Evaluate the role played by the authors in the development of the genre
CO 3: Understand and evaluate the various worlds of Science Fiction
CO 4: To evaluate the cultural nuances present in the science fiction world
<b>Subject and code: PS 126.3- Paper XXIII: Folklore and Mythology</b>
<b>Course Outcomes:</b>
CO 1: Familiarize the students with the theories of folklore and myths
CO 2: Introduce them to the inter-disciplinary nature of the study of folklore and myth
CO 3: Examine the rendition of the original myths and the texts prescribed for study
CO 4: Develop interpretative skills to analyse folktales and myths on their own
<b>Subject and code:PO 127.3-Paper XXIV: CBCS – Interpreting Literature</b>
<b>Course Outcomes:</b>
CO 1: To understand some basic literary criticism concepts
CO 2: To understand the application of criticism to select texts
CO 3: The students will be able to interpret the text by themselves
CO 4: To be able to apply some basic theory to the texts chosen
<b>Semester-IV</b>
<b>Subject and code: PH 121.4 - Paper XXV: Postcolonialism</b>
<b>Course Outcomes:</b>
CO 1: To make the students familiar with terms of colonial, postcolonial, neo-colonial, so on
CO 2: Make use of postcolonial critical concepts to analyse cultural and socio-political conditions
CO 3: Critique the specific meanings of the postcolonial condition
CO 4: Will be able to understand the dimensions of colonialism in the postcolonial world
<b>Subject and code:PH 122.4 - Paper XXVI: Cultural Studies</b>
<b>Course Outcomes:</b>
CO 1: To make students familiar with the term, Culture and its nuances
CO 2: Evaluate the role how culture is a social construct that needs to be analysed
CO 3: Evaluate the role of hegemony, media, institutions, so on in creating culture
CO 4: Analyse the texts from the perspective of Cultural Studies
<b>Subject and code:PH 123.4- Paper XXVII: American Literature II</b>
<b>Course Outcomes:</b>
CO 1: To continue examine the growth of American Nation into a super power
CO 2: To discuss the experiences of other ethnic groups in America
CO 3: To evaluate the texts from the perspective of various theories
CO 4: To evaluate modern day America as a melting pot
<b>Subject and code: PH 124.4-Paper XXVII Project</b>
<b>Course Outcomes:</b>
CO 1: To produce a research project at the end of the academic year
CO 2: To follow all rules related to academic and research writing
CO 3: To produce quality research
CO 4: To try to publish the work if possible
<b>Subject and code: PS 125.4- Paper XXIX: Cultures of Dakshina Kannada in Translation</b>
<b>Course Outcomes:</b>
CO 1: To introduce the students to basic concepts in translation.
CO 2: Highlight the rich tradition available in the regional literature of Dakshina Kannada

CO 3: Enable students to form their own interpretations of the multihued culture of modern-day India
CO 4: Be able to perform some basic translation activities
<b>Subject and code: PS 126.4- Paper XXX: Diaspora Literature</b>
<b>Course Outcomes:</b>
CO 1: To critically examine the term, Diaspora and Dispora theory
CO 2: To examine the texts and understand the nuances of Diaspora
CO 3: To evaluate the problems of the diaspora community
CO 4: To understand the culture and needs of the diaspora community
<b>Subject and code: PS 127.4- Paper XXXI: Gender Studies</b>
<b>Course Outcomes:</b>
CO 1: To critically examine the term, Gender
CO 2: To evaluate the problems of the groups that forms the gender minority
CO 3: To critically evaluate on the role of patriarchy in society
CO 4: To examine the texts and understand the nuances of gender
<b>Subject and code: PS 128.4-Paper XXXII: Literature from the Margins</b>
<b>Course Outcomes:</b>
CO 1: To critically examine the term, subaltern, hegemony, margins, so on
CO 2: To examine the plight of the various oppressed classes around
CO 3: To critically evaluate the role of hegemonic institutions in creating the marginalized
CO 4: To examine the texts and understand the plight of the marginalized

<b>Department Name:</b>	<b>P 200 M.S.W.</b>
<b>PROGRAMME OUTCOMES and PROGRAMME SPECIFIC OUTCOMES</b>	
PO1. Our graduates will demonstrate professional knowledge of Social Work They will be able to, PSO1.1 Gain understanding into the needs of individuals, families, groups and communities and design Social Work intervention strategies PSO 1.2 Understand and analyze the structure and functions of various social, economic and political institutions PSO 1.3 Understand the significance of methods of Social Work Profession PO2. Our graduates demonstrate value-based professionalism and volunteerism They will be able to PSO2.1 Acquire values and ethics of Social Work Profession PSO 2.2 Develop concern and commitment for marginalized sections of the society PSO 2.3 Internalize social justice, cultural pluralism and democratic participation while reaching out to marginalized PO3. Our graduates will demonstrate the skills to practice Professional Social Work They will be able to PSO 3.1 Develop skills of practicing methods of Social Work and addressing social problems at micro and macro levels PSO 3.2 Develop skills of programme development, management and research PSO 3.3 Develop skills of effective communication at various levels in their professional life	
<b>SEMESTER I</b>	
<b>Subject and code: Paper: PH201.1 - SOCIAL WORK: HISTORY AND IDEOLOGIES</b>	

<b>Course Outcomes:</b>
By the end of the course the student will be able to Understand the history and evolution of Social Work Profession both in India and in the West Differentiate between professional and voluntary Social Work Demonstrate the knowledge on methods of Social Work Recognize the trends in Social Work practice
<b>Subject and code: Paper: PH 202.1 - CASE WORK PRACTICE</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Acquire proficiency in basic concepts of Social Case Work practice Obtain effective qualities to establish harmonious relationship between the client and the society Critically analyze problems of individuals and families and various determinants for human problems Obtain therapeutic knowledge and skills to work in various settings
<b>Subject and code: Paper: PH 203.1: GROUP WORK PRACTICE</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Understand group work as a method of Social Work and its significance Display the knowledge on process, phases of group formation and will learn to identify and deal with the group dynamics Demonstrate skill of applying group work as a method of social work in social interventions
<b>Subject and code: PH 204.1 CONCURRENT FIELDWORK PRACTICUM - I</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Understand the functioning of social welfare agencies and and analyse various facilities available for people from Government, social institutions and voluntary organ Learn the composition and needs of the community
<b>Subject and code: Paper: PS 205.1: DYNAMICS OF HUMAN BEHAVIOUR</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Acquire a clear understanding on the concepts of human behaviour Gain a conceptual understanding into the various theories of development and its relevance. Analyse the changes throughout the life span stages and identify problems across these stages. Relate these developmental changes across the life span with real life situations.
<b>SEMESTER II</b>
<b>Subject and code: Paper: PH 201.2 - COMMUNITY ORGANIZATION AND SOCIAL ACTION</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to * Understand community organization and social action as a method of Social Work * Analyze the situation of subaltern groups and communities in our society * Acquire skills of using participatory strategies of community development and social action
<b>Subject and code: Paper: PH 202.2: SOCIAL WORK RESEARCH AND STATISTICS</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Acquire knowledge of the scientific method of inquiry for the study of social phenomena Develop an understanding of the research process and basic research skills

Demonstrate an understanding into the different methods of data collection and sampling. Gain knowledge of measures of central tendency, measures of dispersion, inferential statistics and its uses in Social work Research.
<b>Subject and code: PH 203.2 CONCURRENT FIELDWORK PRACTICUM- II</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Demonstrate the knowledge and skills of case work and group work practice and community organisation Acquire knowledge of research project and basic skills of research Learn the skills of liasoning between Government and people
<b>Subject and code: Paper: PS 204.2: SOCIAL SCIENCES PERSPECTIVES FOR SOCIAL WORK</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Understand the concepts, structure, institutions and processes of Indian Society. Demonstrate the knowledge on divergent perspectives and necessary skills for analyzing Indian Society. Develop critical insights on the social problems and challenges confronting Indian Society. Understand and analyze economic and political systems in India and society –economy – politics linkages.
<b>Subject and code: Paper No: PO 205.2 INDIAN SOCIAL PROBLEMS AND INTERVENTIONS</b>
<b>Course Outcomes:</b>
<b>By the end of the course the student will be able to Develop insights into the problems faced by the vulnerable section of the society Analyse the impact of social issues on the individual and the community Demonstrate knowledge and skills to mitigate the problems at an initial level Understand the role of institutional services for the welfare of people</b>
<b>SEMESTER III</b>
<b>Subject and code:Paper: PH 201.3: SOCIAL WELFARE ADMINISTRATION</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Recognize the concept of social welfare and its relevance in modern India Analyse the role of social welfare services in societal well being Understand the functioning of social welfare Organisations Identify the key elements to manage an Organisation effectively
<b>Subject and code:PH 203.3a: CONCURRENT FIELDWORK PRACTICUM-III</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Understand the structure and dynamics of communities Identify and analyze the needs of the communities Develop skills of working with communities by applying the Social Work methods - Social Action, Social Work research and Community Organization Design and implement participatory community development modules and projects
<b>Subject and code:Paper: PS 204.3a: TRIBAL, RURAL AND URBAN DEVELOPMENT</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Get conceptual clarity of tribal, rural and urban communities and analyse the dynamics in these communities

Demonstrate in depth knowledge on challenges of tribal, rural and urban communities and analyze the intervention of Government and Non-Government Organisations Acquire skills of working with tribal, rural and urban communities applying the methods of Professional Social Work
<b>Subject and code: Paper: PS 205.3a: CITIZEN PARTICIPATION AND LOCAL SELF- GOVERNANCE</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to Recognize the key concept of citizenship, participation and governance. Develop critical understanding of the functioning of local government institutions Acquire understanding of the role of social work in promoting citizen participation in governance.
<b>Subject and code: PH 203.3b: CONCURRENT FIELDWORK PRACTICUM - III</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to <ul style="list-style-type: none"> <li>• Understand the functioning of a health setting</li> <li>• Acquire skills in conducting case work (Medical /Psychiatric)</li> <li>• Demonstrate skills of working with patient as well as family in the management of Patient</li> <li>• Exhibit counselling skills and therapeutic treatment techniques to study and assess clients with psychological and socio-economic conditions</li> <li>• Develop skills of planning and conducting health awareness programmes</li> <li>• Demonstrate knowledge on documentation of interventions in health setting</li> </ul>
<b>Subject and code: Paper: PS 204.3b: COUNSELLING: THEORY AND PRACTICE</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to <ul style="list-style-type: none"> <li>• Understand the Holistic Concept of Counselling as a tool for help</li> <li>• Recognize and synthesize attitudes and values that enhance investment of Self in the Counsellors' role</li> <li>• Acquire knowledge and skills of using therapeutic approaches</li> <li>• Articulate the role of a Counsellor as a professional in dealing with various issues of life and to work in different settings</li> </ul>
<b>Subject and code: Paper: PS 205.3b: PSYCHIATRIC SOCIAL WORK</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to <ul style="list-style-type: none"> <li>• Acquire knowledge on the concept of Mental disorders and Psychiatric Social work.</li> <li>• Develop an understanding of the various classifications of Psychiatric disorders in children, adolescents and adults, their signs, symptoms, causes and Psycho social Interventions.</li> <li>• Demonstrate knowledge and skills in the practice of Social work in Community Mental health and Rehabilitation.</li> <li>• Gain knowledge on the legal provisions for Mental Health.</li> </ul>
<b>Subject and code: PH 203.3C: CONCURRENT FIELDWORK PRACTICUM-III</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to

<ul style="list-style-type: none"> <li>Exhibit skills of dealing with human resources for Organisational Development</li> <li>Understand the working conditions and mechanisms of Human Resource Development for employee welfare.</li> </ul>
<b>Subject and code:PS 204.3c: HUMAN RESOURCE MANAGEMENT AND DEVELOPMENT</b>
<b>Course Outcomes:</b>
<p>By the end of the course the student will be able to</p> <ul style="list-style-type: none"> <li>Describe and analyse the role of HR Department in an Organisation</li> <li>Recognize the need for employee development function</li> <li>Identify the challenges faced by the Human Resource professionals and understand ways to resolve it.</li> <li>Demonstrate knowledge and skills for people management</li> </ul>
<b>Subject and code:PS 205.3c: LABOUR LEGISLATIONS AND INDUSTRIAL RELATIONS</b>
<b>Course Outcomes:</b>
<p>By the end of the course the student will be able to</p> <ul style="list-style-type: none"> <li>Understand various Labour legislations and Industrial Relations in India</li> <li>Interpret and apply relevant laws and acts in specific cases</li> <li>Critically reflect on issues, limitations and challenges confronting labor laws in India</li> <li>Gain Insights on labour problems and industrial relations in India and offer meaningful inputs for improvement of labour-industry relations</li> </ul>
<b>Subject and code:PO 206.3 - HUMAN RIGHTS AND SOCIAL DEFENCE (Open Elective)</b>
<b>Course Outcomes:</b>
<p>By the end of the course the student will be able to</p> <ul style="list-style-type: none"> <li>Define and explain the concept of human rights and recognize the rights of various marginalized sections of society</li> <li>Apply human rights framework for understanding vulnerable groups</li> <li>Acquire competencies of using the legal provisions and social defence systems to protect the vulnerable</li> </ul>
<b>SEMESTER IV</b>
<b>Subject and code:PS 201.4: PROJECT PLANNING AND MANAGEMENT</b>
<b>Course Outcomes:</b>
<p>By the end of the course the student will be able to</p> <ul style="list-style-type: none"> <li>Acquire knowledge and skills to facilitate participatory project management</li> <li>Develop competency to facilitate process of participatory planning with varied groups.</li> <li>Imbibe values and attitudes that are essential for participatory projects for development</li> </ul>
<b>Subject and code:PH 202.4a: CONCURRENT FIELDWORK PRACTICUM-IV</b>
<b>Course Outcomes:</b>
<p>By the end of the course the student will be able to</p> <ul style="list-style-type: none"> <li>Develop the skills of community organizer</li> <li>Learn the administrative tasks</li> <li>Inculcate professional values of community organizer</li> </ul>
<b>Subject and code:PS 203.4a: EDUCATION FOR DEVELOPMENT</b>
<b>Course Outcomes:</b>

<p>By the end of the course the student will be able to</p> <ul style="list-style-type: none"> <li>• Develop critical perspective on the system of formal as well as non-formal education.</li> <li>• Acquire skills of designing educational programmes for varied groups of disadvantaged learners</li> <li>• Develop Social Work strategies in the field of education.</li> </ul>
<b>Subject and code:PS 204.4a CORPORATE SOCIAL RESPONSIBILITY</b>
<b>Course Outcomes:</b>
<p>By the end of the course the student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts, need and functioning of CSR in India</li> <li>• Analyze the CSR strategies of various corporate sectors of India</li> <li>• Develop the skills and knowledge of managing CSR projects and socially responsible initiatives</li> </ul>
<b>Subject and code:PH 202.4b: CONCURRENT FIELDWORK PRACTICUM - IV</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• By the end of the course the student will be able to</li> <li>• Understand the role of Psychiatric and Medical Social Worker in a health setting</li> <li>• Acquire skills in conducting case assessment and diagnosis (Medical /Psychiatric)</li> <li>• Specific Skills in working with patient as well as family in the management of patient</li> <li>• Develop skills in planning and conducting health awareness programmes</li> <li>• Demonstrate knowledge on documentation of interventions in health setting</li> <li>• Exhibit knowledge on specific areas of Medical Social Work in health care settings</li> </ul>
<b>Subject and code: PS 203.4b: WORKING WITH CHILDREN AND FAMILIES</b>
<b>Course Outcomes:</b>
<p>By the end of the course the student will be able to</p> <ul style="list-style-type: none"> <li>• Gain understanding into the problems of children and adolescents and need for child welfare</li> <li>• Demonstrate knowledge of various child welfare services, programmes, policies and legal provisions.</li> <li>• Develop an understanding of the family life cycle stages, identify problems across these stages and Social work interventions.</li> <li>• Gain insight into working with the changing families.</li> </ul>
<b>Subject and code:PS 204.4b: MEDICAL SOCIAL WORK</b>
<b>Course Outcomes:</b>
<p><b>By the end of the course the student will be able to</b></p> <ul style="list-style-type: none"> <li>• Demonstrate knowledge on communication strategies for promotion of health in prevention, care and management.</li> <li>• Critically appraise policies, programmes and advocacy strategies of various national and inter-national organizations in the field of health and care services</li> <li>• Articulate personal and professional values and promote skills required to perform as valued professionals in a multidisciplinary health settings</li> <li>• Utilize community resources for purposes of consultation, collaboration, advocacy, referral, and networking on behalf of clients and families and reinforce the needs of clients.</li> </ul>
<b>Subject and code:PH 202.4C: CONCURRENT FIELDWORK PRACTICUM-IV</b>

<b>Course Outcomes:</b>
By the end of the course the student will be able to <ul style="list-style-type: none"> <li>• Acquire social work knowledge and professionalism in the areas of Human Resource Development</li> <li>• Develop critical understanding on applicability of labour legislations in various organizational set- up</li> </ul>
<b>Subject and code:PH 202.4C: CONCURRENT FIELDWORK PRACTICUM-IV</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• By the end of the course the student will be able to</li> <li>• Understand the role of Psychiatric and Medical Social Worker in a health setting</li> <li>• Acquire skills in conducting case assessment and diagnosis (Medical /Psychiatric)</li> <li>• Specific Skills in working with patient as well as family in the management of patient</li> <li>• Develop skills in planning and conducting health awareness programmes</li> <li>• Demonstrate knowledge on documentation of interventions in health setting</li> </ul> Exhibit knowledge on specific areas of Medical Social Work in health care settings
<b>Subject and code:PS 203.4c: EMPLOYEE WELFARE IN INDIA</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• By the end of the course the student will be able to</li> <li>• Demonstrate proficiency in the concept of Employee Welfare</li> <li>• Relate the role of Human Resource professionals in development of employee conditions</li> <li>• Propose and implement employee welfare programmes</li> <li>• Interpret labour laws and apply provisions for employee/organisational development</li> </ul>
<b>Subject and code:PS 204.4c: ORGANIZATIONAL BEHAVIOUR AND DEVELOPMENT</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to <ul style="list-style-type: none"> <li>• Understand the concepts and foundations of organizational behaviour</li> <li>• Develop capacity to analyze the motivations and implications of individual and group behaviour on organizations.</li> <li>• Demonstrate knowledge on nature of organizational set up.</li> <li>• Critically analyze the dynamics of organizational behaviour and to reflect on the essentials of organizational development</li> </ul>
<b>Subject and code:PS 205.4 RESEARCH PROJECT</b>
<b>Course Outcomes:</b>
By the end of the course the student will be able to <ul style="list-style-type: none"> <li>• Understand the nature of social science research and its distinctive characteristics</li> <li>• Understand the requirements and components of social science research</li> <li>• Develop a critical perspective of the subject matter in the backdrop of review of literature</li> </ul>

<b>Department Name:</b>	<b>P 300 M.B.A.</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO1: Business Acumen: To apply acquired KSA (Knowledge, Skills and Abilities) in the domain of management sciences to detect, diagnose, predict and resolve Business problems.</p> <p>PO2: Analytical and critical thinking: To adopt analytical and critical thinking for scenario analysis based decision-making.</p> <p>PO3: Ethical leadership: To exhibit ethical behaviour in managerial choices as responsible corporate citizens.</p> <p>PO4: Team management: To lead diverse cross-functional teams in a globalized organizational environment to optimize the welfare of stakeholders.</p> <p>PO5: Ideation: To be able to generate, develop and communicate new ideas.</p> <p>PO6: Catalytic Innovation: To approach social problems in an innovative way to create viable, feasible, sustainable solutions.</p> <p>PO7: Ecological sustainability: To spear head environmentally responsible decisions that cater to the needs of the present without compromising the future.</p> <p>PO8: Developmental alliances: To develop an association at the individual and organizational level for mutual attainment of objectives and goals.</p> <p>PO9: Continual learning: To adopt experiential learning for reflection on real world situations and ensure life-long learning.</p> <p>PO10: Value based education: To internalise values that promote effective learning and reinforce continuous improvement of the personal, social, moral, and economic wellbeing.</p> <p>PO11: Professional development: To refine the industry readiness and agility of business professionals</p> <p>PO12: Community Spirit: To engage in service oriented activities so as to empowering and benefiting social stakeholders.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<ul style="list-style-type: none"> <li>• To nurture innovative and ethical business leaders to navigate the dynamic global environment</li> <li>• To develop a culture of sustainable entrepreneurship to promote empowerment and inclusion</li> <li>• To impart holistic and transformative management education to create intrinsically motivated, ethically sound, morally upright, socially conscious and competent professionals.</li> </ul>	
<b>SEMESTER: I</b>	
<b>Subject and code:PH 301.1 Principles of Accounting</b>	
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>• To demonstrate knowledge of accounting concepts and techniques and to make sound financial and economic decisions in real world settings.</li> <li>• To analyze the effect of business transactions using debits and credits.</li> <li>• To evaluate financial statement and access a range of different outcomes and the ability to justify the chosen outcome.</li> <li>• To identify and evaluate worksheet and closing entries for an organization.</li> <li>• To evaluate the most common components of shareholders' equity.</li> </ul>	
<b>Subject and code:PH 302.1 ORGANISATIONAL BEHAVIOUR</b>	
<b>Course Outcomes:</b>	

To apply the concept of organizational behavior to understand the behavior of people in the organization.

- To consider personality traits, attitude, emotion, values, learning and perception of individuals in the workplace and act accordingly to increase individual's productivity and job satisfaction.
- To apply motivation theories to analyze the performance problems.
- To demonstrate skills required for working in groups including leadership skill and manage power, politics and conflict.
- To be able to implement change effectively in an ever-dynamic organisation environment

**Subject and code:PH 303.1 ECONOMICS FOR MANAGERS**

**Course Outcomes:**

- To learn the fundamental principles of economics and their application in business decision making.
- To understand the market dynamics in a free enterprise economy.
- To study the behavior of production function in short run and long run and its impact on firms' cost of structure.
- To examine the structure of product market and its implications on the nature of competition and strategic decisions.
- To comprehend the measurement of Gross Domestic Product (GDP) and its derivatives.

**Subject and code:PH 304.1 STATISTICS FOR BUSINESS DECISIONS**

**Course Outcomes:**

- To apply statistical concepts, techniques and applications to analyses current business problems
- To analyze data using univariate and bivariate statistical tools.
- To enable optimum decision making adopting probability concepts in ambiguous managerial environment.
- To employ the appropriate statistical inferential techniques and apply it to generalize data on population
- To apply ANOVA to make inferences on more than two population data sets.

**Subject and code:PH 305.1 PRINCIPLES OF STRATEGIC MANAGEMENT**

**Course Outcomes:**

- To analyze strategy as a unique activity and to distinguish it from operational effectiveness.
- To analyze the impact of and role of external environment in the prospects of business and to develop strategies using external environment analysis.
- To conduct internal analysis of companies and to generate feasible paths to create capabilities and distinctive competencies in organizations.
- To generate and to execute corporate level, business level and functional level strategies.
- To apply recent developments in strategic management to achieve sustainable competitive advantage.

**Subject and code:PH 306.1 PRINCIPLES OF MARKETING**

**Course Outcomes:**

- Understanding and acquainting with the basic concepts of marketing management

<ul style="list-style-type: none"> <li>• Understanding the components, and categorizing type and levels of product offered to the customer</li> <li>• Ability in determining the pricing strategy for the product offering</li> <li>• Acquainting with the concepts of distribution and its role and importance in marketing</li> <li>• Apprising the need and importance of promotion in marketing function</li> </ul>
<b>Subject and code:PS 307.1 CONTEMPORARY BANKING</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Incorporate the knowledge and understanding of a range of areas on Banking Technology</li> <li>• Awareness of the latest trends and developments in banking</li> <li>• Understanding of the basic terminology in Banking</li> <li>• Applying acquired skills and competencies to help to manage the diverse range of situations which occur in a dynamic banking environment</li> <li>• Reviewing the challenges of the Indian Banking Sector in the LPG era and implementing of strategic mechanism to cope with the challenges</li> </ul>
<b>Subject and code:PS 308.1 PRINCIPLES OF HUMAN RESOURCE MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To Effectively manage and plan key human resource functions within organizations</li> <li>• To develop job description and specification and successfully accomplish human resource planning of the organization.</li> <li>• To be able to apply the relevant skill set which is required to address the current issues, trends, practices in Recruitment, Selection and Orientation</li> <li>• To develop and implement training, and development programme and design performance management system</li> <li>• To design compensation package and be cable to manage industrial relations.</li> </ul>
<b>Subject and code:PS 309.1 MANAGEMENT DATA ANALYTICS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To apply principles and skills of economics, marketing, and decision making to contexts and environments in data science</li> <li>• To build and enhance business intelligence capabilities by adapting the appropriate technology and software solutions</li> <li>• To acquire the ERP concepts for real world applications</li> <li>• To understand Data Warehouse fundamentals and Data Mining principles</li> <li>• To communicate effectively using Data Visualization with MS Excel</li> </ul>
<b>Subject and code:PS 310.1 EXECUTIVE COMMUNICATION</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To develop strategies for improving organizational communication</li> <li>• To effectively use verbal and non-verbal communication in business discourse</li> <li>• To compose business messages by using appropriate formats of messages</li> <li>• To formulate strategies for writing appropriate letters for various purposes</li> <li>• To prepare a professional resume and cover letter</li> </ul>
<b>Subject and code:PS 311.1 SOCIAL MARKETING</b>
<b>Course Outcomes:</b>
To internalize the basic concept of and need for social marketing

To transform into practice-ready social marketers ready to juxtapose and carry along social marketing and corporate marketing objectives harmoniously  
 To apply the systematic and comprehensive framework of social marketing  
 To bring into effect the influential new 3Cs model (Containment, Counter-Marketing, and Critical Capacity Building)  
 To embody the spirit of social marketing which involves the application of marketing techniques to social ends

## **SEMESTER II**

**Subject and code:PH 301.2 OPERATIONS MANAGEMENT**

### **Course Outcomes:**

- To formulate the input–process–output framework and apply it to a wide range of operations
- To identify the elements of operations management and various transformation processes to enhance productivity and competitiveness
- To analyze and design the work systems by calculating the basic, allowed and standard time and also be able to identify and efficiently manage bottlenecks.
- To apply different forecasting models/techniques both quantitative and qualitative
- To analyze and evaluate various facility alternatives and their capacity decisions, develop a balanced line of production & scheduling and sequencing techniques in operation environments.

**Subject and code:PH 302.2 INTERNATIONAL BUSINESS ENVIRONMENT**

### **Course Outcomes:**

- To identify the development of pattern of international trade with the help of trade theories
- To analyse the role of globalisation in modern times and to evaluate the multilateral agreements while framing global business strategies
- To design internationalisation strategies for firms and to utilise the benefits of expansion of firms in foreign markets especially emerging markets
- To analyse international business environment evaluating various cultural, social, economic and demographic elements and to design business tactics according to market dynamics.
- To identify the various means for international investment and to appraise the significance of each with the help of various theories.

**Subject and code:PH 303.2 BUSINESS RESEARCH METHODOLOGY**

### **Course Outcomes:**

- To apply research and knowledge acquired in business decisions.
- To critically evaluate secondary data and apply it for optimum business decision making.
- To apply knowledge of research process and practices to assess business environment and solve business problems.
- To apply survey research concepts, methods and techniques in modern day research problem.
- To draft research proposals, report with citation techniques.

**Subject and code:PH 304.2 BUSINESS LAW**

### **Course Outcomes:**

<ul style="list-style-type: none"> <li>• To develop a practical understanding of the basic concepts of those laws which regulate businesses</li> <li>• To apply legal ideas, principles and concepts understood earlier through concrete business case law</li> <li>• To recognize the linkages between law and other fields like marketing, finance, economics and information systems</li> <li>• To apply the basic principles of Contract Law and Company Law in business</li> <li>• To foresee the impact of relevant economic laws and laws relating to intellectual property</li> </ul>
<b>Subject and code:PH 305.2 COST AND MANAGEMENT ACCOUNTING</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To apply both conventional and emerging concepts to facilitate managerial decision making.</li> <li>• To assess the impact of costing methods on valuation of stock and net profit.</li> <li>• To adopt the cost volume profit analysis for short- and long-term decision making.</li> <li>• To formulate master budget and functional budgets for organizational planning and control purposes.</li> <li>• To measure the deviations that arise in organizations as compared to the standards set and take corrective action.</li> </ul>
<b>Subject and code:PH 306.2 ENTREPRENEURSHIP MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To develop the spirit of entrepreneurship among the young management graduates and contribute towards the Economic Development</li> <li>• To develop next generation innovators, intrapreneurs, entrepreneurs and change-makers</li> <li>• To direct the budding entrepreneurs to start up their own venture following the legal formalities and be equipped with the required capital.</li> <li>• To formulate and present the business plans in a professional manner to all the stakeholders.</li> <li>• To be able to effectively manage the various stages of growth of an entrepreneurial firm</li> </ul>
<b>Subject and code:PS 307.2 CORPORATE FINANCIAL MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To apply theoretical framework for considering corporate finance problems, and issues.</li> <li>• To review the impact of allocation, management and funding of financial resources.</li> <li>• To assess risk and return based on the given scenario.</li> <li>• To evaluate the financial objectives of various types of organizations and the requirements of all the stakeholders</li> <li>• To assess the sources of corporate finance which lead to optimal capital structure decisions</li> </ul>
<b>Subject and code:PS 308.2 LEADERSHIP IN BUSINESS ORGANISATIONS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To synthesize leadership development through application of theoretical knowledge.</li> </ul>

<ul style="list-style-type: none"> <li>• To Identify and develop traits and characteristics essential for leadership development.</li> <li>• To appraise the application of charismatic and transformational leadership styles in the contemporary business organizations.</li> <li>• To measure implementation of contingency theories of leadership in varying business conditions.</li> <li>• To justify ethical leadership in contemporary business organizations.</li> </ul>
<b>Subject and code:PS 309.2 SERVICES MARKETING</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Successfully navigate the challenges of services marketing and develop distinct strategies and tactics more attuned to services</li> <li>• To develop strong customer relationships through service quality to organizations whose core product is service and to organizations that depend on service excellence for competitive advantage</li> <li>• To apply frameworks for customer focussed management and increase customer satisfaction and retention through service quality</li> <li>• To successfully implement service strategies for competitive advantage across industries</li> <li>• To generate the service advantage by measuring and managing service quality enabling cocreation and cross functional treatment of issues through integration of marketing with other domains in the organization</li> </ul>
<b>Subject and code:PS 310.2 ECONOMETRIC ANALYSIS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To translate business problems into formal testable hypothesis within regression model</li> <li>• To construct linear regression equations to model business decision making problems</li> <li>• To draw inference from estimated regression results</li> <li>• To identify and develop solutions to the problems that results from violating the assumptions of classical regression model</li> <li>• To estimate and validate linear regression models using E-Views, STATA and R</li> </ul>
<b>Subject and code:PS 311.2 SYSTEMS THINKING FOR MANAGERS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To provide a better understanding of the significance of Systems Thinking in the current business context.</li> <li>• To analyse the basic systems laws of Systems Thinking.</li> <li>• To provide detailed information on the basic archetypes or templates of Systems Thinking and its applications in solving managerial problems.</li> </ul>
<b>SEMESTER III</b>
<b>Subject and code:PH 301.3 BUSINESS ETHICS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To inculcate a sense of ethical values and ethical behaviour at personal, professional and corporate governance level.</li> <li>• To Understand Human Person as unique and a foundation for any ethical issues.</li> <li>• Distinguish the ethical and unethical issues and practices in the marketing management and Human Resource Management of a firm.</li> </ul>

<ul style="list-style-type: none"> <li>• Examine the implications of issues and unethical practices in the area of finance and accounts.</li> <li>• To examine the implications of issues and unethical practices in the area of Environment and Technological Development.</li> </ul>
<b>Subject and code:PH 302(a).3 LOGISTICS AND SUPPLY CHAIN MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Acquainting with the basic concepts, processes, and scope and key elements of a supply chain.</li> <li>• Apprising role, functions, strategies and decision making in Warehousing function</li> <li>• To develop the understanding of classification, role, policies and costs in Inventory management</li> <li>• Analyzing and applying the structure, logistical program and make decisions in designing of distribution channel</li> <li>• Exploring the developments taking place in the field of logistics and supply chain</li> </ul>
<b>Subject and code:PH 302(b).3 CREATIVITY AND INNOVATION MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Identifying the role of Industrial Revolution 4.0 and Innovation in designing Sustainable Development practices.</li> <li>• Apprising the role of Creativity, Innovation and Imagination in Experience engineering.</li> <li>• Understand the role of different types of innovations to respond to the agile business environment.</li> <li>• Interpreting and practicing the pattern of Innovation with the help of various models of innovation.</li> <li>• Designing the right customer solutions and to create customer value propositions using design thinking and to generate innovative ideas for social change</li> </ul>
<b>Subject and code:PS 303(a).3 INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Become informed, independent and ethical investors in various financial instruments.</li> <li>• Find attractive career as advocates of capital markets, investment advisers and portfolio managers.</li> <li>• Grow as campaigners of investor's awareness programs and make more and more knowledgeable investing community.</li> <li>• Fashion as crusaders against the financial market fraudsters and safeguard the investors' interest.</li> <li>• Become champions in new financial products development.</li> </ul>
<b>Subject and code:PS 303(b).3 SHORT TERM DECISION MAKING IN FINANCE</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Underling the management of current assets and current liabilities</li> <li>• Evaluating the ability of a firm to continue its operations</li> <li>• Comprehending the capacity of a firm to meet its maturing short-term debt and upcoming operational expenses.</li> <li>• Assessing the various components of working capital</li> <li>• Determining factors that affect firm's liquidity, risk and shareholder wealth.</li> </ul>
<b>Subject and code:PS 303(c).3 INTERNATIONAL FINANCIAL MANAGEMENT</b>

<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To demonstrate basic understanding of the global business environment and the international monetary system</li> <li>• To compute the Balance of Payments and evaluate various aspects of capital account liberalization.</li> <li>• To demonstrate the significance of various market participants and components of the international financial markets.</li> <li>• To forecast exchange rates based on the parity conditions that should apply between spot rates, forward rates, inflation rates, and interest rates.</li> <li>• To demonstrate how international capital budgeting can be applied to determine whether an international project should be implemented.</li> </ul>
<b>Subject and code:PS 303(d).3 MERCHANT BANKING AND FINANCIAL SERVICES</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Articulating the significant role played by Financial Services sector in the realm of Economic Development of a Country.</li> <li>• Deliberate on the prominent components of the financial sector providing specialized services</li> <li>• Illustrate specialized knowledge in existing and emerging areas of the Financial Services.</li> <li>• Enhance the technical knowhow of the Banking and Financial market.</li> <li>• Understanding of how credit rating and its regulatory framework functions.</li> </ul>
<b>Subject and code:PS 304(a).3 INDUSTRIAL RELATIONS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Successfully navigate the challenges of managing all aspects of work and employment between the parties to an employment contract</li> <li>• To develop strong skills in resolving issues relating to people as groups/collectives vis a vis management in unionized and in non-unionized situations</li> <li>• To apply frameworks for managing conflict in the industry including techniques like arbitration, mediation and conciliation</li> <li>• To successfully implement human resource management strategies for successfully managing industrial relations which in turn will influence and affect the performance of organizations</li> <li>• To generate the human capital advantage by being mature business personnel who recognize and understand the need for labour to collectivise in India even in the era of the fourth industrial revolution</li> </ul>
<b>Subject and code:PS 304(b).3 ORGANISATIONAL CHANGE AND DEVELOPMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To implement change successfully in an organization</li> <li>• To apply the concept of organizational renewal in the workplace in order to create an agile organization.</li> <li>• To act as an Organization Development practitioner and design various Organization development interventions.</li> <li>• To align organization culture and structure with the change and development strategy of the organization.</li> <li>• To use Information Technology effectively in organizational design</li> </ul>

<b>Subject and code: PS 304(c).3 TALENT MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To assess the role of Talent management in achieving organizational objectives and to design a Talent Management system</li> <li>• To evaluate the role of Talent management in the current volatile environment using various Talent management models</li> <li>• To build an effective employer brand with the help of employee value proposition and to attract the best talent with the employer brand</li> <li>• To develop suitable Talent development strategies using potential identification, executive development programs and Talent pipeline management strategies</li> <li>• To design the right Talent retention strategy with the help of employee engagement initiatives and to align Talent strategy to business strategy</li> </ul>
<b>Subject and code:PS 304(d).3 INTERNATIONAL AND STRATEGIC HUMAN RESOURCE MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Develop understanding to manage human resources in the global context.</li> <li>• Involving in recruiting, selection and training the staff for international assignments</li> <li>• Actively participating in designing and developing of international performance management &amp; compensation system</li> <li>• Becoming instrumental in aligning HR Strategy to the Organizational Strategy</li> <li>• Involve in strategizing the HR process</li> </ul>
<b>Subject and code:PS 305(a).3 SALES AND DISTRIBUTION MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To propose emerging functions of sales management in modern business organizations.</li> <li>• To plan personal selling strategies for successful salesmanship activities.</li> <li>• To design the functions for selecting and retaining efficient salesmen for the sales organization.</li> <li>• To defend the role of distribution management in creating place and time utility.</li> <li>• To revise the activities of intermediaries in delivering value for customers in the modern business scenario.</li> </ul>
<b>Subject and code:PS 305(b).3 RURAL MARKETING</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Awareness creation about Indian rural market</li> <li>• Understanding the consumer behavior and decision making process in rural markets</li> <li>• Understanding and application of the marketing mix practiced in the rural market</li> <li>• Sensitizing the need of innovative distribution system required in the rural market</li> <li>• Apprising the need of innovative research techniques to understand the rural market better</li> </ul>
<b>Subject and code:PS 305(c).3 STRATEGIC BRAND MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To gain valuable perspectives on the challenges in creating and nurturing strong brands.</li> </ul>

<ul style="list-style-type: none"> <li>• To provide managers with concepts and techniques to improve the long term profitability of their brand strategies</li> <li>• To combine a comprehensive theoretical foundation with enough practical insights to assist them in their day to day and long term brand decisions</li> <li>• To create profitable brand strategies by building, measuring and managing brand equity.</li> <li>• To recognise the effects of their day to day marketing decisions on brand performance</li> </ul>
<b>Subject and code: PS 305(d).3 CONSUMER BEHAVIOUR</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To develop appropriate marketing strategies by applying the knowledge of consumer behavior in segmenting markets.</li> <li>• To apply personality traits and consumer perceptions in positioning products and predicting buyer behavior.</li> <li>• To strategize entry into new market segments and devise strategies for customer retention based on formation of customer attitudes and to apply attitude changing models to attract/ woo competitor's loyals to switch.</li> <li>• To attract global markets by penetrating the products based on social, economic and cultural dimensions.</li> <li>• To prepare plans/policies relating to corporate social responsibility and pave the way for ethical conduct of business.</li> </ul>
<b>Subject and code:PS 306(a).3 FACILITY LOCATION AND PROCESS DESIGN</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Enhanced understanding of facility location and layout decisions</li> <li>• Comprehensive knowledge of factors affecting facility location and layout decisions</li> <li>• Strategize on best possible process to implement based upon product profile of the Organization.</li> <li>• Implement and evaluate process flow based on product attribute and process competencies.</li> <li>• Insight of operations process design-selection of equipment and technology.</li> </ul>
<b>Subject and code:PS 306(b).3 INVENTORY AND WAREHOUSE MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Articulate knowledge of inventory systems its valuations, decision and control techniques used in inventory management.</li> <li>• Develop and manage effective and efficient warehouse management system.</li> <li>• Understanding of relationship between warehousing, inventories and supply chain planning.</li> <li>• Effect of managerial decisions in functional area of Warehouse management.</li> <li>• Implement feasible, effective and efficient warehousing system in retail setup.</li> </ul>
<b>Subject and code:PS 306(c).3 MATERIALS AND PROCUREMENT MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Understand elementary idea of material management linkages with other areas of management, supply chain management and production processes.</li> <li>• Critique successful supply chain management practices.</li> <li>• Integrate a biblical worldview within the context of material management.</li> </ul>

<ul style="list-style-type: none"> <li>Deliberate the role of materials management in other areas of management functions.</li> </ul>
<b>Subject and code:PS 306(d).3 SERVICE OPERATIONS MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>Getting acquainted to the nature, classification, framework and delivery systems of services</li> <li>Evaluating criteria for site selection for service industry</li> <li>Understanding the concept of yield management and its importance and application to the service industry</li> <li>Analyzing and applying Inventory management in service industry</li> <li>Apprising digital application in service sector</li> </ul>
<b>Subject and code:PS 307(a).3 FINANCIAL MODELING</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>To perform accurate financial calculations with the help of packages like MS Excel and R.</li> <li>To create interactive financial models which help in quick decision making.</li> <li>To scrutinize the dividend payment pattern of the corporations and their implications.</li> <li>To construct the financial statements and to predict the future financial positions of the companies.</li> <li>To analyze the implications of corporate events on the share prices and to take informed investment decisions.</li> </ul>
<b>Subject and code:PS 307(b).3 PEOPLE ANALYTICS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>To enable to make data-driven decisions to attract, manage, and retain employees</li> <li>To effectively manage the challenges involved in implementing analytics</li> <li>To develop data driven, proactive workforce planning and take appropriate workforce-related decisions.</li> <li>To use the talent sourcing analytics, talent acquisition analytics and predictive analytics for making HR decisions.</li> <li>To apply analytics in onboarding and performance management system.</li> </ul>
<b>Subject and code:PS 307(c).3 DATA DRIVEN MARKETING</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>To conduct descriptive marketing analysis using excel</li> <li>To predict market swings based on price fluctuations</li> <li>To forecast sales adopting various statistical forecasting tools</li> <li>To estimate life time customer value and allocation of resources for customer acquisition and retention</li> <li>To segment markets and predict duration of future sales</li> </ul>
<b>Subject and code:PS 307(d).3 FORECASTING ANALYTICS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>To disentangle the components of time series data</li> <li>To construct data driven models of forecasting, such as naïve models, moving average models and exponential smoothing models</li> <li>To build and validate stationary time series models</li> </ul>

<ul style="list-style-type: none"> <li>• To apply multivariate and volatility models for forecasting, such as VAR, Granger</li> <li>• Causality, ARCH and GARCH Models</li> <li>• To construct and evaluate time series models using E-Views/R</li> </ul>
<b>SEMESTER IV</b>
<b>Subject and code:PH 301.4 CORPORATE GOVERNANCE</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To interpret the fundamental concepts and issues in corporate governance in conjunction with the current Indian business scenario.</li> <li>• To appraise the theories and models of corporate governance applied in business organizations across the world.</li> <li>• To review the application of committee recommendations in business organizations in India.</li> <li>• To Justify the role of boards and committees in the healthy governance of business organizations.</li> <li>• To predict the future of corporate governance and plan best practices for the future.</li> </ul>
<b>Subject and code: PH 302(a).4 DECISION MAKING MODELS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To apply Linear Programming Models and Transportation Problems for tackling business environment challenges quantitatively to allocate limited resources.</li> <li>• To employ the Decision Theory techniques to analyze current business problems under risk certainty and uncertainty.</li> <li>• To apply the Replacement Models techniques in planning of replacing of items keeping cost considerations.</li> <li>• To apply Network Modelling of activities to ensure optimum utilization of human and other resources like time and cost.</li> <li>• To employ simulation tools for real world business problems where mathematical modeling may not be applied and make strategic decisions</li> </ul>
<b>Subject and code:PH 302(b).4 KNOWLEDGE MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To be able to relate the concepts of knowledge management to the real world.</li> <li>• To apply complex theories of knowledge management to a wide range of scenarios;</li> <li>• To exhibit the skills and competences to work as an effective knowledge managers and knowledge workers in a knowledge-based organization.</li> <li>• To use the effective tools for knowledge transfer and sharing.</li> <li>• To be able align organizational culture in knowledge application.</li> <li>• To implement various KM strategies and metrics for the success of knowledge management.</li> <li>• To lead knowledge knowledge-based organization from ethical, and legal perspective</li> </ul>
<b>Subject and code:PH 303.4 SUMMER INTERNSHIP PROJECT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To use the effective tools for knowledge transfer and sharing.</li> <li>• To be able align organizational culture in knowledge application.</li> </ul>

<ul style="list-style-type: none"> <li>To implement various KM strategies and metrics for the success of knowledge management.</li> </ul>
To lead knowledge knowledge-based organization from ethical, and legal perspective
<b>Subject and code: PS 304(a).4 FINANCIAL REPORTING AND ANALYSIS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>Evaluate different types of performance measurement systems in accounting and commonly used financial control systems.</li> <li>Interpret financial statement based on different techniques of analysis.</li> <li>Design appropriate business policies and strategies to meet stakeholder and shareholder needs in the light of the recent changes in financial reporting.</li> <li>Create, evaluate financial statement and access a range of different outcomes and the ability to justify the chosen outcome.</li> <li>Estimate the future financial outcomes for a company based on forecaster's own assumptions and beliefs.</li> </ul>
<b>Subject and code: PS 304(b).4 TAXATION FOR MANAGERS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>Expose students to real life situations involving taxation and to equip them with techniques for taking tax-sensitive decisions.</li> <li>Assess the value of goods and services for payment of GST.</li> <li>Exhibit a clear understanding of various provisions of GST system and utilisation of input tax credit.</li> <li>Demonstrate the ability to draw meaningful conclusions about tax compliance of individuals, business firms and companies.</li> <li>Advise on valuation of goods for payment of customs duty.</li> </ul>
<b>Subject and code: PS 304 (c).4 PROJECT FINANCING AND APPRAISAL</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>Comprehend the conceptual clarity about project organization and feasibility analyses -Market, Technical, Financial and Economic.</li> <li>Analyse and understand the techniques for Project planning, scheduling and Execution Control.</li> <li>Apply the risk management plan and analyse the role of stakeholders.</li> <li>Apprehend Project Procurement, generation and screening of project ideas to excel in the industry.</li> <li>Analyse the prerequisites for successful Project Implementation considering the human perspectives for the benefit of the society at large.</li> </ul>
<b>Subject and code: PS 304(d).4 DERIVATIVES AND RISK MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>To enhance the investment basket by including the various financial derivative products.</li> <li>To become independent investor/trader in the derivatives market.</li> <li>To apply the derivative trading strategies to hedge the positions against risk.</li> <li>To face the practical challenges in the application of derivative instruments.</li> <li>To formulate alternative trading strategies to the conventional strategies.</li> </ul>
<b>Subject and code: PS 305(a).4 TRAINING AND DEVELOPMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>Attain basic concepts of training and development and its process</li> </ul>

<ul style="list-style-type: none"> <li>• Assimilate best of all the components of training and development and familiarize it.</li> <li>• Gain a deeper understanding of the tools and techniques of the training process.</li> <li>• Familiarize training strategy with corporate strategy.</li> <li>• Learn new approaches to the training programme in a changed environment.</li> </ul>
<b>Subject and code: PS 305(b).4 LABOUR LAW</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To examine the constitutional provisions of Labour Legislations and to incorporate the newly introduced labour codes in the work place</li> <li>• To assess the various challenges faced by trade unions and to evaluate the various provisions of Trade unions Act, 1926 and to examine the various statutory requirements of Industrial Disputes Act, 1947.</li> <li>• To analyse and to incorporate the different provisions of Factories Act, 1948.</li> <li>• To assess the various statutory requirements as specified by wage legislations and to critically analyse different wage legislations</li> <li>• To evaluate social security as a human right and to apply the various provisions of Social Security legislations in the work place</li> </ul>
<b>Subject and code: PS 305(c).4 STAFFING AND COMPENSATION MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To implement effective staffing system and strategy in the organization</li> <li>• To be able to manage staffing activities in the workplace.</li> <li>• To apply the concept of compensation and reward management in firms</li> <li>• To administer wage and salary system effectively.</li> <li>• To practice performance-based reward system in the organization setting.</li> </ul>
<b>Subject and code: PS 305(d).4 PUBLIC RELATIONS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To demonstrate an understanding of the public relations practice.</li> <li>• To practice public relations based on the theoretical foundation.</li> <li>• To use Media and Communication in Public Relations activities.</li> <li>• To recognize the importance of community relations in building public relations.</li> <li>• To manage crisis situation with effective public relations practice.</li> </ul>
<b>Subject and code: PS 306(a).4 ADVERTISING MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To gain valuable perspectives on the internal and external environmental challenges involved in managing and integrating a firms marketing communication</li> <li>• To provide managers with concepts and techniques to conceptualise and execute creative advertising in various media</li> <li>• To combine a comprehensive theoretical foundation with enough practical insights to assist them in practical communication management</li> <li>• To expertly optimise the use of all major marketing communication tools like sales promotion, direct marketing, public relations and publicity.</li> <li>• To create profitable marketing communication strategies by optimising media planning and putting creative ideas to the test of fixed budgets and defined objectives through the process of evaluation</li> </ul>
<b>Subject and code: PS 306(b).4 NEW PRODUCT DEVELOPMENT</b>
<b>Course Outcomes:</b>

<ul style="list-style-type: none"> <li>• Understanding the strategic importance, classification and hierarchy of products</li> <li>• Involving in the nuances of concept generation and evaluation in the new product development process</li> <li>• Involving in the process of evaluation and selection of concepts in new product development process</li> <li>• Acquainting with the process of product development, design and team management in the NPD process</li> <li>• Recognizing the importance of product testing and commercialization phase in the NPD process</li> </ul>
<b>Subject and code:306(c).4 RETAIL MANAGEMENT AND VISUAL MERCHANDISING</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To plan retail operations most effectively and efficiently in contrast with the core retail concepts.</li> <li>• To design effective retailing strategies based on consumer needs and market changes.</li> <li>• To formulate most effective pricing strategies to drive customers to retail organizations.</li> <li>• To recommend the best solution for effective customer servicing and enhance customer satisfaction for a retail organization.</li> <li>• To design most appropriate visual merchandising for retail organization based on the nature of the store and type of product offered.</li> </ul>
<b>Subject and code:PS 306(d).4 DIGITAL MARKETING</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Acknowledging the impact of digital movement in the present marketing scenario</li> <li>• Understanding the social media impact in the present marketing scenario</li> <li>• Acquainting with the drivers in the social marketing domain</li> <li>• Enabling to adopt and experiment with the online tools for marketing function</li> <li>• Apprising the developments in digital domain and impacts on the marketing domain</li> </ul>
<b>Subject and code:PS 307(a).4 OPERATIONS ANALYTICS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Development of analytical and problem solving skills, confidence to use tools, ability to visualize data and infer decisions.</li> <li>• Develop a multi-dimensional approach to problem solving/decision making</li> <li>• Exposure to practical analysis tools in decision making and problem solving in operations</li> <li>• Model future demand uncertainties, to predict the outcomes of competing policy choices and to choose the best course of action in the face of risk.</li> <li>• Find an attractive career in the area of operations analytics.</li> </ul>
<b>Subject and code:PS 307(b).4 PURCHASE MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Comprehensive understanding of process of the purchase management and practical aspects involved in it.</li> <li>• Find an attractive career in purchase division of the well-known business houses</li> <li>• Become an expert consultant in the area of purchase and procurement.</li> </ul>

<ul style="list-style-type: none"> <li>• Develop modern and customized purchase system and help the corporates to achieve greater efficiency in purchasing.</li> <li>• Emerge as an expert negotiator between the corporate buyers and sellers.</li> </ul>
<b>Subject and code:PS 307(c).4 STRATEGIC OPERATIONS MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Understanding the the importance of strategic operations management.</li> <li>• Understanding the scope of operations management to gain competitive advantage.</li> <li>• Building step by step operations strategy.</li> <li>• Implementing the strategic operations strategies to meet the objectives of the firm.</li> </ul>
<b>Subject and code:PS 307(d).4 TOTAL QUALITY MANAGEMENT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To achieve the objectives of quality control by understanding the need for total quality management.</li> <li>• To implement and use the theories developed by the various philosophers in creating customer focus and achieving customer satisfaction.</li> <li>• To apply various statistical tools to measure quality and to analyze the quality-cost relationship.</li> <li>• To be able to measure customer satisfaction by the use of the Kano Model and Teboul Model.</li> <li>• To identify and analyze the cost of benchmarking and to utilize the tools of concurrent engineering in total quality management.</li> </ul>
<b>Subject and code:PS 307 (e).4 PROJECT FINANCING AND APPRAISAL</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Comprehend the conceptual clarity about project organization and feasibility analyses -Market, Technical, Financial and Economic.</li> <li>• Analyse and understand the techniques for Project planning, scheduling and Execution Control.</li> <li>• Apply the risk management plan and analyse the role of stakeholders.</li> <li>• Apprehend Project Procurement, generation and screening of project ideas to excel in the industry.</li> <li>• Analyse the prerequisites for successful Project Implementation considering the human perspectives for the benefit of the society at large.</li> </ul>
<b>Subject and code:PS 308(a).4 FINANCIAL ANALYTICS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To become expert in different software packages in technical analysis and to guide others.</li> <li>• To inculcate the problem solving ability whenever need arises in the area investment management.</li> <li>• To become self-reliant investors and traders in financial products.</li> <li>• To obtain an attractive career in the field of investment analysis.</li> <li>• To create awareness among the investing community about the fraudulent investment tips providers.</li> </ul>
<b>Subject and code:PS 308(b).4 TALENT ANALYTICS</b>
<b>Course Outcomes:</b>

<ul style="list-style-type: none"> <li>• To measure talent engagement and make a strong organizational culture to improve performance</li> <li>• To enable the students with the technique of predicting the attrition rate using analytics</li> <li>• To leverage big data to significantly improve the value of the workforce.</li> <li>• To optimize employee wellness, health and workplace with predictive analytics</li> <li>• To be competent to handle the future demands of talent analytics</li> </ul>
<b>Subject and code:PS 308(c).3 MARKETING ANALYTICS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To acquaint the learner with concepts and tools of Marketing Analytics</li> <li>• To understand how data needs to be analyzed for providing meaningful directions or insights to marketing problems</li> </ul>
<b>Subject and code:PS 308(d).4: DATA VISUALIZATION</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To transform data into interactive visual reports and dashboards</li> <li>• To identify appropriate data visualization techniques given particular requirements imposed by the data</li> <li>• To prepare data and to create and manage relationship for visual analytics</li> <li>• To construct compelling visualizations using Power BI and Tableau</li> </ul>

<b>Department Name:</b>	<b>P 310 M.Com.</b>
<b>PROGRAMME OUTCOMES</b>	
PO1: Apply knowledge of management theories and practices to solve contemporary and complex business problems. PO2: Ability to lead themselves and others in the achievement of business goals through value-based leadership skills PO3: Ability to analyse and communicate global, economic, financial, legal, and ethical aspects of business. PO4: Understand the values of life-long learning. PO5: Ability to work in a team of core competence or multidisciplinary teams.	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
PSO 1: Develop entrepreneurial skills through effective Industry Institute Interactions. PSO 2: Qualify in various competitive examinations related to career growth and succeed in procuring best opportunities in the corporate and academia	
<b>Semester I</b>	
<b>Subject and code: PH 311.1 Accounting Theory and Practice</b>	
<b>Course Outcomes:</b>	
Evaluate the notions & ideas of thought that have shaped a theoretical basis for accounting. <ul style="list-style-type: none"> <li>•Examine the relationship between accounting theory and practice.</li> <li>•Examine the role of Conceptual framework in the standard setting process.</li> <li>•Apply critical thinking by identifying and analyzing accounting issues using relevant accounting frameworks.</li> <li>•Prepare Financial Statements in accordance with appropriate standards.</li> </ul>	

<b>Subject and code: PH 312.1 Financial Management and Policy</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Demonstrate the applicability of the concept of Financial Management to understand the managerial Decisions and Corporate Capital Structure.</li> <li>• Familiarize with cost of capital and capital structure to support managerial decisions.</li> <li>• Apply the Leverage and EBIT EPS Analysis associate with Financial Data in the corporate.</li> <li>• Analyse the complexities associated with management of cost of funds in the capital Structure.</li> </ul>
<b>Subject and code: PH 313.1 Income Tax</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Acquire profound clarity on concepts pertaining to personal tax.</li> <li>• Understand relevance of investments to be made for better tax planning.</li> <li>• Recognize the modes of tax planning with respect to chosen occupation.</li> <li>• Inculcate decision making power in managing investments with regard to tax.</li> <li>• Decide on Investment gestation based on tax policies of the country.</li> </ul>
<b>Subject and code: PS 314.1 Economic Environment and Policy</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Recognize the state of any given economy based on sovereign characteristics.</li> <li>• Identify the modes of channelizing capital into the economy.</li> <li>• Understand, analyze and recommend policies for better economic framework.</li> <li>• Conceptual clarity on legal rights of individuals as citizens of the country pertaining to business.</li> </ul>
<b>Subject and code: PS 315.1 Corporate Law, Ethics and Governance</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Acquaint with the knowledge of corporate law and its administration in India.</li> <li>• Recognize the inherent conflict of interest in many business decisions and Demonstrate an understanding of common ethical problems in businesses.</li> <li>• Demonstrate a critical appreciation of the growing importance of corporate social responsibility and how it relates to corporate strategy.</li> <li>• Critically evaluate the concepts and committees of corporate governance.</li> </ul>
<b>Subject and code: PS 316.1 - Quantitative Techniques for Decision Making</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Understand managerial decision-making processes in organizations and appreciate the use of various quantitative techniques in making decision;</li> <li>• Apply quantitative techniques to solve a variety of business problems</li> <li>• Comprehend the concept of a Transportation Model and develop the initial solution for the same;</li> </ul>
<b>Subject and code: PS 317.1 Working Capital Management</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Analyse working capital management policies and their impact on the firm's profitability, liquidity and operating flexibility.</li> <li>• Understand the importance of working capital management and its role in meeting the firm's strategic objectives and value creation.</li> </ul>
<b>Semester II</b>

<b>Subject and code: PH 311.2 Corporate Accounting and Reporting</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Build a solid foundation in accounting and reporting requirements.</li> <li>• Develop comprehensive understanding of the advanced issues in accounting for assets, liabilities and owner's equity.</li> <li>• Account for a range of advanced financial accounting issues.</li> <li>• Prepare the accounts of companies undergoing amalgamation &amp; external reconstruction.</li> <li>• Prepare consolidated accounts for a corporate group.</li> <li>• Analyse the various issues &amp; problems related to published financial statements.</li> </ul>
<b>Subject and code: PH 312.2 Corporate Financing and Investment Decisions</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Calculate the yearly cash flows of different types of capital budgeting project and evaluate how the choice of depreciation method affects the cashflows</li> <li>• Apply several capital budgeting techniques appreciating the strengths and weaknesses of the different techniques</li> <li>• Understand how to incorporate risk and uncertainty into capital budgeting decisions</li> <li>• Assess the factors affecting international investment decisions and opportunities presented to an organisation</li> <li>• Evaluate alternative sources of financing options and investment opportunities and their suitability in particular circumstances</li> </ul>
<b>Subject and code: PS 313.2 Business Taxation</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Acquire conceptual clarity in the model of GST.</li> <li>• Have sound knowledge on technical jargons in relation to the tax system.</li> <li>• Understand the channel of working of dual GST system.</li> <li>• Make the best advantage of the tax prospects provided through GST regime.</li> <li>• Have profound knowledge on Customs Act and the modes of assessment.</li> </ul>
<b>Subject and code: PS 314.2 Business Statistics</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Understand data and draw inference from data</li> <li>• Calculate and interpret statistical values by using statistical tool (correlation &amp; regression)</li> <li>• Demonstrate an ability to apply various statistical tool to solve business problems</li> </ul>
<b>Subject and code: PS 315.2 Research Methodology and Ethics</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Identify research output with philosophical base and greater relevance to the society</li> <li>• Undertake quality research with scientific methodology</li> <li>• Produce good Research Reports</li> <li>• Undertake original Research following ethical guidelines and practices in conducting the research and publication of papers.</li> </ul>
<b>Subject and code: PS 316.2 E-Business</b>
<b>Course Outcomes:</b>

<ul style="list-style-type: none"> <li>• Able to understand concepts of E-Commerce and E- business</li> <li>• Analyze different types of portal technologies commonly used in the industry.</li> <li>• Integrate theoretical frameworks with business strategies.</li> </ul>
<b>Subject and code:PS 317.2 Internship</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Exposure to the industrial/business world to get practical experience in the day to day affairs of the business enterprises</li> <li>• Practical application of the theoretical knowledge of the students in the field of accounting, costing, taxation, human resource, finance, marketing and management</li> <li>• Studying the office environment, experiencing the day to day business decisions, superior- subordinate relationship and experiencing the work life</li> <li>• Learning entrepreneurial skills and understanding issues and challenges of entrepreneurship</li> </ul>
<b>Subject and code: PO 318.2 Personal Finance and Investment Planning</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Identify the major types of investment alternatives.</li> <li>• Describe how safety, risk, income, growth, and liquidity affect your investment decisions.</li> <li>• Figure out the future value of money using future value charts.</li> </ul>
<b>Subject and code: PS 356.2 E-Business</b>
<b>Course Outcomes:</b>
<p>CO 1: Summarise the fundamentals of entrepreneurship with its role in economic development and to motivate them towards E-business activities.</p> <p>CO 2: Use the concept of entrepreneurial leadership and stimulate them to think innovative as entrepreneurs to implement in E-business</p> <p>CO 3: Assess technologies and business points of view to show the business cases that are viable right now.</p> <p>CO 4: Develops an understanding of transacting electronically and emerging technology for the same</p> <p>CO 5: Design business entity in the light of the legal and regulatory framework in India.</p>
<b>Semester III</b>
<b>Subject and code: PH 351.3 Equity Research and Security Market Operation</b>
<b>Course Outcomes:</b>
<p>CO 1:To understand the concept of Equity Research and acquaint with the thorough knowledge of fundamental analysis.</p> <p>CO 2: To study different tools of analysis of company performance.</p> <p>CO 3:To understand the workings of Capital Market in India.</p> <p>CO 4:To familiarize with recent development in the area of primary and secondary market.</p> <p>CO 5:To be able to analyse and apply technical methods in stock trading</p>
<b>Subject and code: PH 352.3 Mergers, Acquisitions and Corporate Restructuring</b>
<b>Course Outcomes:</b>
<p>CO 1: To focus on the questions concerning motivations for mergers and empirical evidence related to those motivations.</p>

CO 2: To provide an analytical framework for evaluating the strategic and financial impact of M&A's on corporations and their stakeholders.  
 CO 3: To have a basic understanding on different forms of corporate restructuring.  
 CO 4: To study various forms of takeover tactics and defenses.  
 CO 5: To examine the regulatory framework of M&As.  
 CO 6: To present a critical examination and analysis of due diligence and integration.

**Subject and code: PH 353.3 Investment Banking and Financial Services**

**Course Outcomes:**

CO 1: Explain the basic concepts and activities under investment banking and financial services  
 CO 2: Compare and contrast commercial banking, investment banking and merchant banking  
 CO 3: Evaluate the concepts under issue management and private equity  
 CO 4: Analyse the importance and workings of Underwriting, leasing and forfeiting in real business operations.  
 CO 5: Critically evaluate the importance and workings of credit rating institutions, depository systems and other financial institutions

**Subject and code: PS 354.3P Data Analysis using SPSS**

**Course Outcomes:**

Co 1 :Students will get to know the use of Statistical Package for the Social Sciences (SPSS), user-friendly software in social science research.  
 Co 2 : Students will understand the application of SPSS in solving research problems

**Subject and code: PS 355.3 Corporate Tax Planning**

**Course Outcomes:**

CO 1: Identify the difference between Tax Evasion, Tax Planning and Tax Avoidance.  
 CO 2: Analyse various deductions, rebates and reliefs to reduce the taxable income and tax liability of companies  
 CO 3: Assess tax aspects of Transfer pricing  
 CO 4: Discuss the application of Deductions and Collection of Tax at Source for Corporate  
 CO 5: Summarize Double Taxation Avoidance Agreement.  
 CO 6: Demonstrate tax planning in respect of corporate reorganization

**Subject and code: PS356.3 Insurance and Risk Management**

**Course Outcomes:**

CO 1: Discuss the risk identification and measurement.  
 CO 2: Describe the various concepts under insurance  
 CO 3: Examine the operations of insurance companies  
 CO 4: Analyse the concept of insurance premium and financial statements of insurance companies  
 CO 5: Summarize the regulatory aspects of insurance

**Subject and code: PO 357.3 - Corporate Culture and Ethics**

**Course Outcomes:**

CO 1: Describe the nature and scope of ethics, contrast between the ethics and moral, personal ethics and professional/business ethics  
 CO 2: Evaluate the conflict of interest and ethical dilemma and measures to mitigate unethical

practices in various fields

CO 3: Examine the impact of corporate culture on ethics.

CO 4: Identify the ethical codes and value system in the work culture.

#### **Semester IV**

**Subject and code International Financial Management**

**Course Outcomes:**

Co 1: To study different components of the International Financial and Monetary System.

Co 2: To study various aspects of balance of payment and affects of various cross border transaction on BOP account.

Co 3: To have an understanding of forex market and its regulatory framework.

Co 4: To provide knowledge in exchange rates and exchange risk management.

Co 5: To study the various methods of managing currency exposure.

Co 6: To provide knowledge in various aspects of international financial management.

**Subject and code: PH 352.4 Cost Analysis for Managerial Decisions**

**Course Outcomes:**

CO 1 :To study different components of the International Financial and Monetary System.

CO 2: To study various aspects of balance of payment and affects of various cross border transaction on BOP account.

CO 3: To have an understanding of forex market and its regulatory framework.

CO 4: To provide knowledge in exchange rates and exchange risk management.

CO 5: To study the various methods of managing currency exposure.

CO 6: To provide knowledge in various aspects of international financial management.

**Subject and code: PH 353.4P R for Data Analysis**

**Course Outcomes:**

CO 1: Analyse the basics in R programming in terms of constructs, control statements, string functions

CO 2: Organize, Import, review, manipulate and summarize data-sets in R

CO 3: Utilize data-sets to create testable hypotheses and identify appropriate statistical tests

CO 4: Evaluate R programming from a statistical perspective

**Subject and code:PH 354.4 Project**

**Course Outcomes:**

CO 1 :Students will be able to develop research interest and culture in their respective field of study

CO 2 :Students explore the social relevance and application of their respective subject

CO 3 :It provides practical knowledge and exposure in their studied area

CO 4 :It enables the students to make in depth study of the particular issue and explore solution to the problems the society facing in the field of commerce and management

**Subject and code: PS 355.4 Financial Derivatives**

**Course Outcomes:**

CO-1:To explain the role of derivative markets.

CO-2:To examine the trading mechanics derivative contracts.

CO-3:To examine the different derivative instruments.

CO-4:To apply the valuation models for pricing the derivatives.

CO-5:To analyse the option hedging strategies

**Subject and code: PS 356.4 Corporate Law, Ethics and Governance**

<b>Course Outcomes:</b>	
CO 1: Evaluate the regulatory aspects and the broader procedural aspects involved in different types of companies covering the Companies Act 2013 and Rules there under.	
CO 2: Equip with framework provided for safe investments and companies surveillance by SEBI	
CO 3: Explain the accountability of corporates towards its stakeholders to create an integrated value framework for sustainability	
CO 4: Critically evaluate Corporate Social Responsibility with real life examples and its different dimensions.	
CO 5: Create a framework for effective corporate governance by understanding the role and responsibility of different stakeholders in large business corporations	
<b>Subject and code: PS 357.4 Business Analysis and Valuation</b>	
<b>Course Outcomes:</b>	
CO -1: To examine the effectiveness of an organisation's strategy.	
CO -2: To appraise the techniques of valuation.	
CO -3: To discuss the approaches to enterprise valuation.	
CO -4: To develop skills for the valuation of assets and liabilities.	
CO -5: To explain the value based management methods.	
<b>Subject and code: PS 358.4 Portfolio Theory and Management</b>	
<b>Course Outcomes:</b>	
CO 1: Describe the environment of investment and risk return framework.	
CO 2: Evaluate portfolios along with a deep understanding of Capital market theory and associated models.	
CO 3: Examine the equity investments using Portfolio Evaluation & Performance measures	
CO 4: Construct the portfolio by using the ideas of great investors in equity investment	

<b>Department Name:</b>	<b>P 500 M.Sc. (Biotechnology)</b>
<b>PROGRAMME OUTCOMES</b>	
To provide state-of-the-art knowledge and skills in the field of Biotechnology.	
To generate manpower trained in Biotechnology suited to meet the needs of the industry and academia.	
To train students to pursue committed research in the field of Biotechnology.	
To train students for practical oriented project work.	
To have a positive impact on human and animal health, agriculture and environment in the region.	
To have 100 % placement for all the students who take up this course.	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
A post-graduate student upon completion of the programme is expected to gain the following attributes:	
PSO 1: In-depth knowledge of Biotechnology with inter-disciplinary perspective of other branches of life sciences.	
PSO 2: Develop an ability to solve, analyze and interpret data generated from experiments done in project work or practical courses.	

PSO 3: Competence for research and innovation in Biotechnology as a skilled experimentalist. PSO 4: Analytical and problem-solving skills with regard to biochemical principles of life processes and technologies for combating human diseases. PSO 5: Critical thinking about the concepts in Biotechnology and ability to critically review scientific literature for development of new theories and testable hypothesis. PSO 6: Capacity for decision making with regard to scientific progress, personal development and career choice. PSO 7: Ability to work independently, while still promoting team work and collaboration skills. PSO 8: Oratory (public speaking), scientific conversation and writing skills. PSO 9: Leadership and organizational skills. PSO 10: Execute their professional roles in society as biotechnology professionals, employers and employees in various industries, regulators, researchers, educators and managers. PSO 11: Demonstration of integrity, honesty, ethical behaviour and sense of responsibility. PSO 12: Appreciation of diversity in scientific community and responsibility towards society and nation. PSO13: Environmental awareness vis-à-vis bio-waste generation, disposal and management and safety and security issues.

**Subject and code: PH 501.1 BIOCHEMISTRY AND METABOLISM**

**Course Outcomes:**

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

- Delineate structure, function and interrelationships of various biomolecules and consequences of deviation from the normal.
- Translate the importance of biological macromolecules and their role in living systems.
- Execute a particular metabolic pathway involved in carbohydrate, lipid, amino acid and nucleic acid metabolism, their interconnections.

Evaluate information relevant to concepts on cellular regulation of different metabolic pathways.

**Subject and code: PH 502.1 MICROBIOLOGY**

**Course Outcomes:**

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

- Apply the principles in classifying microbial systems and know their beneficial and harmful effects.
- Employ various cultivation methods starting from screening to preservation of the desired microbe.
- Understand the major virus groups with their elementary features that is responsible for causing the most dreaded diseases.
- Appreciate the microbial diversity and their interactions, and design suitable strategies to tackle unsustainable agricultural and environmental practices

**Subject and code: PH 503.1 CELL AND MOLECULAR BIOLOGY**

**Course Outcomes:**

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

- Describe the organization of macromolecules on membranes and cellular processes.

<ul style="list-style-type: none"> <li>• Differentiate the various cell signaling pathways. Illustrate regulation of gene expression in eukaryotes.</li> <li>• Take up research in the field of cell and molecular biology.</li> </ul>	
<b>Subject and code: PH 504.1 P</b>	<b>BIOCHEMISTRY &amp; METABOLISM PRACTICALS</b>
<b>Course Outcomes:</b>	
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Apply knowledge of biochemistry and metabolism in various cellular functions, and the application of research involved in various biochemical processes.</li> <li>• Investigate and analyse the unknown carbohydrate or amino acid compound present in the given sample qualitatively.</li> <li>• Demonstrate a proficiency in developing relevant biochemical questions, carrying out laboratory investigations to answer those questions, and critically analysing, interpreting, and presenting the results of their experiments.</li> </ul> <p>Construct the standard curve, analyse the data and interpret the results.</p>	
<b>Subject and code: PH 504.1 P</b>	<b>BIOCHEMISTRY &amp; METABOLISM PRACTICALS</b>
<b>Course Outcomes:</b>	
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Apply knowledge of biochemistry and metabolism in various cellular functions, and the application of research involved in various biochemical processes.</li> <li>• Investigate and analyse the unknown carbohydrate or amino acid compound present in the given sample qualitatively.</li> <li>• Demonstrate a proficiency in developing relevant biochemical questions, carrying out laboratory investigations to answer those questions, and critically analysing, interpreting, and presenting the results of their experiments.</li> </ul> <p>Construct the standard curve, analyse the data and interpret the results.</p>	
<b>Subject and code: PH 505.1 P</b>	<b>MICROBIOLOGY PRACTICALS</b>
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>• At the end of the course, a student should be able to:</li> <li>• Evaluate the various physical and chemical growth requirements of bacteria and equip various methods of bacterial growth measurement.</li> <li>• Execute microbial techniques for the isolation of pure cultures of bacteria.</li> <li>• Master staining procedures, aseptic techniques and be able to perform routine culture handling tasks safely and effectively.</li> </ul> <p>Comprehend the various methods for identification of unknown microorganisms.</p>	
<b>Subject and code: PH 506.1 P</b>	<b>CELL AND MOLECULAR BIOLOGY PRACTICALS</b>
<b>Course Outcomes:</b>	
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Assess membrane transport.</li> <li>• Prepare slides.</li> <li>• Differentiate cell divisions.</li> <li>• Isolate macromolecules and perform qualitative and quantitative assays.</li> <li>•</li> </ul>	
<b>Subject and code: PS 507.1</b>	<b>MOLECULAR AND HUMAN GENETICS</b>
<b>Course Outcomes:</b>	

<ul style="list-style-type: none"> <li>• On completion of this course, a student should be able to:</li> <li>• Discuss the chromosomal mechanisms of sex determination and dosage compensation.</li> <li>• Demonstrate the ability to distinguish between a normal and an abnormal karyotype and the underlying causes of genetic disorders at the molecular level.</li> <li>• Categorize the different methods available for genetic testing and for the treatment and management of genetic disorders.</li> </ul> <p>Construct pedigrees and analyse the patterns of inheritance in the families.</p>
<ul style="list-style-type: none"> <li>• <b>Subject and code: PS 508.1 IMMUNOLOGY</b></li> </ul>
<ul style="list-style-type: none"> <li>• <b>Course Outcomes:</b></li> </ul> <p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Describe which cell types and organs present in the immune response.</li> <li>• Apply basic techniques for identifying antigen-antibody interactions.</li> <li>• Exemplify the adverse effect of immune system including allergy, hypersensitivity and autoimmunity.</li> <li>• Elucidate the reasons for immunization and aware of different vaccination.</li> </ul>
<b>Subject and code: PS 509.1 DEVELOPMENTAL BIOLOGY</b>
<b>Course Outcomes:</b> <p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Describe the main stages of development common to most multicellular organisms.</li> <li>• Demonstrate the cellular behaviours that lead to morphological change during development.</li> <li>• Illustrate how gene activation plays a role in differentiation.</li> </ul> <p>Apply the knowledge gained in the field of research.</p>
<b>Subject and code: PS 510.1P MOLECULAR AND HUMAN GENETICS PRACTICALS</b>
<b>Course Outcomes:</b> <p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Describe the salient features of Drosophila melanogaster.</li> <li>• Apply the basic technique of separation of the eye pigments of D. melanogaster by chromatographic technique.</li> <li>• Analyze the different types of syndrome and their karyotype.</li> </ul> <p>Elaborate the knowledge on sex determination and chromosomal aberrations.</p>
<b>Subject and code: PS 511.1P IMMUNOLOGY PRACTICALS</b>
<b>Course Outcomes:</b> <ul style="list-style-type: none"> <li>• At the end of the course, a student should be able to:</li> <li>• Acquire technical skills and knowledge on staining, identify various immune cells and enumerate them.</li> <li>• Competently perform antigen-antibody interaction for diagnostic test.</li> <li>• Analyze the components of human sera by performing agarose gel electrophoresis.</li> </ul> <p>Perform blood Donation and its procedure, product packing, separation of blood products and labeling.</p>
<ul style="list-style-type: none"> <li>• <b>Subject and code: PS 512.1P DEVELOPMENTAL BIOLOGY PRACTICALS</b></li> </ul>
<ul style="list-style-type: none"> <li>• <b>Course Outcomes:</b></li> </ul> <p>At the end of the course, a student should be able to:</p>

<ul style="list-style-type: none"> <li>• Assess the importance of model organisms in developmental biology.</li> <li>• Distinguish between the stages of development of different organisms.</li> <li>• Develop practical skills in isolation and staining.</li> <li>• Apply the knowledge in contribution towards research.</li> </ul>
<b>SEMESTER II</b>
<b>Subject and code: PH 501.2 GENETIC ENGINEERING</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate the ability to design recombinant molecules.</li> <li>• Design forward and reverse primer to amplify a gene of interest.</li> <li>• Explain transcriptomic analysis and major RNA-Seq platforms.</li> </ul> <p>Apply learned knowledge to their future research.</p>
<b>Subject and code: PH 502.2 ENZYMOLOGY</b>
<b>Course Outcomes:</b>
<p>On completion of this course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Describe the structure, functions and the mechanisms of action of enzymes.</li> <li>• Demonstrate the kinetics of enzyme catalyzed reactions and regulatory processes.</li> <li>• Explain the different immobilization techniques and industrial and clinical scope of enzymes.</li> </ul> <p>Apply the principles of enzyme inhibitions in clinical research.</p>
<b>Subject and code: PH 503.2 P GENETIC ENGINEERING PRACTICALS</b>
<b>Course Outcomes:</b>
<p>On completion of this course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Isolate and purify genomic DNA/RNA.</li> <li>• Demonstrate restriction digestion and ligation experiment.</li> <li>• Standardize a PCR protocol for amplification of a specific target gene.</li> </ul> <p>Gather a thorough knowledge in genetic engineering methods practiced in research.</p>
<b>Subject and code: PH 504.2 P ENZYMOLOGY PRACTICALS</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Design the experiments related to isolation and purification of enzymes.</li> <li>• Apply and extend their knowledge and understanding of enzyme catalysis in research.</li> <li>• Develop accurate skills in enzyme assays.</li> </ul> <p>Construct the standard curve, critically analyse the data and interp</p>
<b>Subject and code: PS 505.2 RESEARCH METHODOLOGY, ETHICS AND PS 505.2 RESEARCH METHODOLOGY, ETHICS AND</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Explain the differences between research methodologies.</li> <li>• Design a small research project with appropriate research method.</li> <li>• Apply correct ways of referencing to and citing from scientific literature.</li> </ul> <p>Analyze, contrast, compare and criticize scientific literature and write a research report/thesis.</p>
<b>Subject and code: PS 506.2 ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY</b>
<b>Course Outcomes:</b>

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

- Discuss the principle and instrumentation of HPTLC, HPLC, GC for identification, and characterization of compounds.
- Apply the principles and theory of UV-Vis spectroscopy, MS (MALDI-TOF and LC-MS/MS), NMR and XRD for the identification and characterization of organic compounds.
- Select an appropriate method of centrifugation or electrophoresis for the separation and identification of analyte molecule by applying the theory and principle of various methods of centrifugation and electrophoresis.

Explain the application of radioisotopes in biology and Instrumentation of Geiger-Muller counter and Solid, Liquid scintillation counters and autoradiography for detection of radio activity.

**Subject and code: PS 507.2    MULTIMICS**

**Course Outcomes:**

Students should be able to:

- Gain knowledge of various computational tools and methods in bioinformatics.
- Discern the crucial concepts and techniques applied in genomics, transcriptomics and proteomics.
- Understand the importance of genomics, proteomics, metabolomics and their applications in various applied areas of biology.

Formulate and assess experimental design for solving theoretical and experimental problems in Genomics, Proteomics and metabolomics.

**Subject and code: PS 508.2    BIOSAFETY AND BIOETHICS**

**Course Outcomes:**

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

- Evaluate biosafety and bioethics in the context of modern biotechnology.
- Describe the standard operating procedures for biotechnology research and assign Biosafety levels.
- Appraise the relevance of different international agreements and protocols for biosafety.

Develop the skills to think critically about risks and risk mitigation strategies needed in their own scientific environment.

**Subject and code: PS 509.2 P    RESEARCH METHODOLOGY AND SCIENTIFIC COMMUNICATION**

**Course Outcomes:**

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

- Explain key research designs and techniques.
- Identify various sources of information for literature review.
- Read, comprehend, and explain research articles in their academic discipline.
- Collect, analyze and represent their data and write a research report/ thesis.

**Subject and code: PS 510.2 P    ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY PRACTICALS**

**Course Outcomes:**

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

- Perform the identification and characterization of various biomolecules using UV Vis spectroscopy, AAS and flame photometry.

<ul style="list-style-type: none"> <li>• Demonstrate the strengths, limitations and use of various chromatographic techniques including paper, TLC, gel filtration and HPLC for the analysis of various biomolecules.</li> <li>• Interpret and analyse the result obtained from various colorimetric assays of protein by plotting a standard curve.</li> <li>• Examine the topography, morphology and composition of various samples by creating the 3D images using SEM.</li> </ul>
<b>Subject and code: PS 511.2 P      MULTIOMICS PRACTICALS</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Assess the nucleotide sequence data of the given species using NCBI/ EMBL/ DDBJ.</li> <li>• Analyse the protein sequence of the species using PIR and Swissprot/ UniProt.</li> <li>• Predict the structure of protein using PDB. View the 3D structure of a protein using RASMOL software.</li> <li>• Carry out the multiple sequence alignment of the proteins with Clustal OMEGA. Search the database of proteins/ nucleic acids using BLAST program.</li> </ul>
<b>Subject and code: PS 512.2P BIOSAFETY AND BIOETHICS PRACTICAL</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate good laboratory procedures and practices.</li> <li>• Examine the design of confinement facilities at different Biosafety levels.</li> <li>• Apply the risk analysis framework to their own or their peers' scientific activities.</li> <li>• Develop a research career in the relevant area, to handle various situations he/she encounters, with adequate caution and care.</li> </ul>
<b>Subject and code: PO 513.2    QUALITY ASSURANCE AND QUALITY CONTROL IN PRODUCT DEVELOPMENT</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Apply quality tools for quality management and main guidelines &amp; requirements of GMP thus contributing to the organization when it comes to understanding industry standards.</li> <li>• Integrate the principles of the GMP quality system and quality control and the important procedures when dealing with complaints and recalls.</li> <li>• Justify the requirements for good documentation practice and complete appropriate documents in compliance with regulatory guidelines.</li> <li>• Execute and adopt quickly into the GMP environment.</li> </ul>
<b>Subject and code: PO 514.2    RECENT TRENDS IN BIOTECHNOLOGY</b>
<b>Course Outcomes:</b>
<p>On completion of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate deep understanding of various methods for gene transfer, gene therapy and in vitro fertilisation of animals.</li> <li>• Discuss and analyze scientific questions related to transgenic plants, role of microbes in industry and agriculture.</li> <li>• Implement the techniques used in molecular diagnostics.</li> <li>• Evaluate the biosensor technology in Healthcare, Food technology and Environmental monitoring.</li> </ul>

<b>SEMESTER – III</b>	
<b>Subject and code: PH 501.3    ANIMAL BIOTECHNOLOGY</b>	
<b>Course Outcomes:</b>	
At the end of the course, a student should be able to: <ul style="list-style-type: none"> <li>• Demonstrate aseptic techniques and good laboratory practices.</li> <li>• Describe the bioprocess technology for economically important products.</li> <li>• Apply the knowledge for improvement of farm animals.</li> <li>• Take up animal based biological research /relevant biotech industry.</li> </ul>	
<b>Subject and code: PH 502.3    PLANT BIOTECHNOLOGY</b>	
<b>Course Outcomes:</b>	
At the end of the course, a student should be able to: <ul style="list-style-type: none"> <li>• Understand the organization of plant genome and intergenomic interaction.</li> <li>• Appraise various methods of marker assistant selection in plant breeding.</li> <li>• Describe various genes used in plant transformation and the role of transgenic plants in human welfare.</li> <li>• Translate the concepts in future studies and debate on the issue related to GMOs and evaluate its significances</li> </ul>	
<b>Subject and code: PH 503.3P    ANIMAL BIOTECHNOLOGY PRACTICAL</b>	
<b>Course Outcomes:</b>	
At the end of the course, a student should be able to: <ul style="list-style-type: none"> <li>• Apply Good Laboratory practices and aseptic techniques.</li> <li>• Initiate primary explant culture and maintain cell lines.</li> <li>• Isolate cells from tissues.</li> <li>• Determine cytotoxicity and growth kinetics.</li> </ul>	
<b>Subject and code: PH 504.3P    PLANT BIOTECHNOLOGY PRACTICALS</b>	
<b>Course Outcomes:</b>	
On completion of this course, a student should be able to: <ul style="list-style-type: none"> <li>• Apply Good Laboratory practices and aseptic techniques.</li> <li>• Prepare the media and other reagents, initiate primary cell culture, Estimate the viability of cells as well as cell concentration.</li> <li>• Perform identification of correct stage of anther for haploid culture and establish and the establishment of secondary embryogenic tissues.</li> <li>• Apply knowledge for large scale clonal propagation of plants through various micropropagation techniques.</li> </ul>	
<b>Subject and code: PS 505.3 INDUSTRIAL BIOTECHNOLOGY</b>	
<b>Course Outcomes:</b>	
At the end of the course, a student should be able to: <ul style="list-style-type: none"> <li>• Explain the screening, strain improvement and design of fermentation media.</li> <li>• Assess the conditions for efficient and sustainable design of bioprocesses.</li> <li>• Integrate scientific and technological knowledge on the use of bioprocesses for industrial products on the cell and process level.</li> <li>• Analyze the processes and their application in healthcare, agriculture, energy and the environment.</li> </ul>	
<b>Subject and code: PS 506.3    ENVIRONMENTAL BIOTECHNOLOGY</b>	
<b>Course Outcomes:</b>	
At the end of the course, a student should be able to:	

<ul style="list-style-type: none"> <li>• Explain and appreciate the concepts of ecology.</li> <li>• Critically examine biodiversity and human linkages, and appreciate the need for biodiversity conservation and contribute to the developmental pathways and policy framework.</li> <li>• Relate an environmental issue with its cause and take an initiative in solving them.</li> <li>• Investigate and develop new biological technologies to mitigate environmental problems.</li> </ul>
<b>Subject and code: PS 507.3 PLANT BREEDING AND SEED TECHNOLOGY</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate an understanding of the automation in plant micropropagation.</li> <li>• Determine the most appropriate method for the breeding of self, cross pollinated and vegetatively propagated crop plants.</li> <li>• Develop a management plan to eliminate pathogens from plant parts and produce Tissue Culture raised plants with Export potentials.</li> <li>• Apply various acts and guidelines in production of certified seeds and plant breeding.</li> </ul>
<b>Subject and code: PS 508.3 MARINE BIOTECHNOLOGY</b>
<b>Course Outcomes:</b>
<p>On completion of this course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Comprehend the uses of seaweeds and their products.</li> <li>• Develop the methods of identification of therapeutic agents from several marine species.</li> <li>• Understand the marine fish hatchery, Shrimp hatchery and farming techniques.</li> <li>• Apply biotechnological principles for feed formulation and its manufacturing.</li> </ul>
<b>Subject and code: PS 509.3 P INDUSTRIAL BIOTECHNOLOGY PRACTICALS</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Execute various selective isolation, replica plating, growth kinetics and the role of various factors affecting the process of microbial growth.</li> <li>• Purify proteins by using various proteins including centrifugation, precipitation, dialysis and ion exchange chromatography.</li> <li>• Evaluate different pathways followed in or by the microbes involved in production of these bio-chemicals. Method of manipulating these pathways to get desired yield.</li> <li>• Demonstrate proficiency in methodologies and equipment employed.</li> </ul>
<b>Subject and code: PS 510.3 P ENVIRONMENTAL BIOTECHNOLOGY PRACTICALS</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Execute scientific collection and preservation of samples.</li> <li>• Perform the analytical tests aimed at establishing the concentration of pollutants in a water sample.</li> <li>• Examine the water quality by microbiological tests.</li> <li>• Demonstrate proficiency in methodologies and equipment employed for the analysis of samples.</li> </ul>

<b>Subject and code: PS 511.3 P PLANT BREEDING AND SEED TECHNOLOGY PRACTICALS</b>	
<b>Course Outcomes:</b>	
At the end of the course, a student should be able to: <ul style="list-style-type: none"> <li>• Demonstrate various layering, grafting and budding techniques.</li> <li>• Perform the genetic analysis of variation in plants.</li> <li>• Design and perform plant hybridization experiments.</li> <li>• Produce synthetic seeds, perform the cryopreservation and evaluate the viability of the seeds.</li> </ul>	
<b>Subject and code: PO 513.3 CLINICAL DRUG DEVELOPMENT AND IPR</b>	
<b>Course Outcomes:</b>	
At the end of the course, a student should be able to: <ul style="list-style-type: none"> <li>• Demonstrate an understanding of the steps involved in the drug discovery and design process.</li> <li>• Demonstrate an understanding of the importance of strict quality control and regulation in the drug development process, and an awareness of GMP, GLP and GDoP.</li> <li>• Design and manage various essential documents for the conduct of a clinical trial.</li> <li>• Apply intellectual property law principles (including copyright, patents, designs and trademarks) to real problems and analyze the social impact of intellectual property law and policy.</li> </ul>	
<b>Subject and code: PO 514.3 BIOREMEDIATION TECHNIQUES</b>	
<b>Course Outcomes:</b>	
At the end of the course, a student should be able to: <ul style="list-style-type: none"> <li>• Describe the concept and applications of bioremediation.</li> <li>• Evaluate the manipulation of prokaryotic and eukaryotic cells in culture, and to apply specific cellular and molecular techniques.</li> <li>• Appraise when each bioremediation strategy would be most applicable, based on the polluted site characteristics.</li> <li>• Develop a new and suitable technique to clean-up the environmental contaminants using the knowledge in bioremediation techniques.</li> </ul>	
<b>Semester-IV</b>	
<b>Subject and code: PH 501.4 FOOD BIOTECHNOLOGY</b>	
<b>Course Outcomes:</b>	
On completion of the course, a student should be able to: <ul style="list-style-type: none"> <li>• Explain the importance of food laws, acts, quality control and sensory evaluations.</li> <li>• Describe the factors affecting growth of microorganisms.</li> <li>• Apply the knowledge of processing and preservation techniques in increasing the shelf life of food products.</li> <li>• Produce different oriental and traditional fermented foods.</li> </ul>	
<b>Subject and code: PH 502.4 MOLECULAR DIAGNOSTICS AND IMMUNOTECHNIQUES</b>	
<b>Course Outcomes:</b>	
On completion of this course, students should be able to: <ul style="list-style-type: none"> <li>• Design PCR based diagnostic method for infectious diseases.</li> <li>• Understand genomics, proteomics and metabolomics that could be employed in early diagnosis and prognosis of human diseases.</li> </ul>	

<ul style="list-style-type: none"> <li>• Execute this knowledge in the processes of antibody engineering, vaccine development, immunization and cancer therapy.</li> <li>• Apply techniques of molecular biology/immunology in research work/pharma industries and other relevant biotech industries.</li> </ul>
<b>Subject and code: PH 503.4 PROJECT DISSERTATION/ INTERNSHIP REPORT AND VIVA VOCE</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Practical approach with topic is learnt by students</li> </ul>
<b>Subject and code: PH 504.4P FOOD BIOTECHNOLOGY PRACTICALS</b>
<b>Course Outcomes:</b>
<p>On completion of the course students will be able to:</p> <ul style="list-style-type: none"> <li>• Explain the different microorganisms associated with food and evaluate the microbial estimation in food.</li> <li>• Identify and control adulterants in various foods and evaluate food quality.</li> <li>• Apply the technique of growing mushrooms as an alternative food product.</li> <li>• Comprehend the knowledge of wine production and launch a startup.</li> </ul>
<b>Subject and code: PH 505.4P MOLECULAR DIAGNOSTICS AND IMMUNO TECHNIQUES</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Design and conduct PCR based experiments for disease diagnostics.</li> <li>• Perform nested PCR experiments for identification of a microorganism.</li> <li>• Demonstrate Real Time PCR.</li> <li>• Perform various immune techniques like ELISA, western blotting.</li> </ul>
<b>Subject and code: PS 506.4 CLINICAL RESEARCH, IPR AND PATENTS</b>
<b>Course Outcomes:</b>
<p>At the end of the course, a student should be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate an understanding of the steps involved in the drug discovery and design process.</li> <li>• Demonstrate an understanding of the importance of strict quality control and regulation in the drug development process, and an awareness of GMP, GLP and GDoP.</li> <li>• Design and manage various essential documents for the conduct of a clinical trial.</li> <li>• Apply intellectual property law principles (including copyright, patents, designs and trademarks) to real problems and analyze the social impact of intellectual property law and policy.</li> </ul>
<b>Subject and code: PS 507.4 STEM CELL TECHNOLOGY AND REGENERATIVE MEDICINE</b>
<b>Course Outcomes:</b>
<p>On completion of this course, students should be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate knowledge of different types of stem cells and their specific characteristics, sources of stem cells, their isolation and characterization.</li> <li>• Understand the clinical need for stem cell therapy and tissue engineering in regenerative medicine.</li> <li>• Understand the innovation and technological progress of stem cell research in recent years.</li> </ul>

Lead a professional career in stem cell technology and cell/tissue engineering in a wide range of health care establishments.

**Subject and code: PS 508.4 BIO-ENTREPRENEURSHIP**

**Course Outcomes:**

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

- Prepare business plan for biotechnology entrepreneurship.
- Address the market challenges for a new enterprise.
- Assess the global market scenario of their product.
- Manage technology transfer for new biotechnology product and launch a startup.

<b>Department Name:</b>	<b>P 510 M.Sc. (Biochemistry)</b>
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**PROGRAMME OUTCOMES**

PO1: Comprehensive knowledge of Biochemistry with inter-disciplinary perspective of other branches of life sciences

PO2: Competence to use modern biochemical and molecular techniques to perform experiments to test scientific hypotheses, analyse data, trouble -shoot and draw conclusions from the experimental data in labs.

PO3: Ability to write research thesis, and present and defend their findings to scientific audiences at regional or national levels.

PO4: Capacity to work independently, while still promoting teamwork and collaboration skills.

**PROGRAMME SPECIFIC OUTCOMES**

PSO 1: Fundamental understanding of Biochemistry, structure and function of biological molecule, mechanisms of biological processes and bioenergetics.

PSO 2: Competence to understand theories and methods that can be used to link Biochemistry to related subjects such as biotechnology, molecular biology, genetics, pharmacology, immunology, genetic engineering and Biostatistics and informatics

PSO 3: Ability to make quantitative measurements of parameters that are routinely encountered in practical/ experimental biochemistry and apply a range of techniques that are commonly used in biomolecule analysis.

PSO 4: Ability to analyse and interpret biochemical data acquired from the experimental procedures and demonstrates analytical and problem-solving skills with regard to biochemical principles of life processes.

PSO 5: Competence in research and innovation in Biochemistry and in related field of specialization and the ability to critically review scientific literature for development of new theories and testable hypothesis.

PSO 6: Basic professional skills pertaining to biochemical analysis, and the ability to use these skills in specific areas such as technology development, industrial production and skills that are relevant to biochemistry-related jobs and employment opportunities

PSO 7: Skill of articulation of ideas, scientific writing, authentic reporting, scientific conversation and writing, capacity for decision making with regard to scientific progress, personal development and career choice.

PSO 8: Entrepreneurial and social competence, the ability to plan and manage projects in order to achieve objectives

PSO 9: Leadership and organizational skills, ability to work independently, while still promoting team work and collaboration skills.

PSO 10: Ability to translate knowledge of biochemistry to address environment issues including, waste disposal management, safety and security issues, nature conservation, sustainability development etc.

PSO 11: Relevant generic and technical skills including communication skills effective interaction with others, listening, speaking, observational skills, utilization of e-resources and ICT.

PSO 12: Professional behavior with respect to attribute like ethical values, integrity, honesty, and sense of responsibility.

### **Semester-1**

#### **Subject and code: PH 511.1. BIOMOLECULES**

##### **Course Outcomes:**

CO 1: Explain the basic aspects of amino acids, peptides, organization of protein structure, carbohydrates, lipids and nucleic acids

CO 2: Describe the structure - function relationship of proteins and nucleic acids.

CO 3: State the role of various biomolecules in health and disease.

CO 4: Interpret the different structures of biomolecules and their implications on different disease states.

CO 5: Explain classification and properties of various biomolecules.

#### **Subject and code: PH 512.1 BIOCHEMICAL TECHNIQUES**

##### **Course Outcomes:**

CO 1: List the basic instruments used in analytical biochemistry and state their applications.

CO 2: Explain the principles and applications of important techniques used in isolation, purification and characterization of various biomolecules.

CO 3: Interpret the various molecular spectrum obtained from different spectral techniques.

CO 4: Explain preparation and analysis of different samples biological samples to be subjected to various analytical techniques.

CO 5: Gain technical competency in different advanced techniques with a comprehensive understanding of their principle, instrumentation and applications.

#### **Subject and code: PH 513.1P BIOQUANTITATION**

##### **Course Outcomes:**

CO 1: Learn good laboratory practices and be able to prepare basics of solutions

CO 2: Perform and explain the principle of colorimetric analysis of various biomolecules.

CO 3: Interpret and present scientific and technical information derived from laboratory experiments.

#### **Subject and code: PS 514.1 ORGANIC AND PHYSICAL BIOCHEMISTRY**

##### **Course Outcomes:**

CO 1: Explain the basic concepts of different types of chemical bonds, that can be useful to understand the chemical nature of biomolecules.

CO 2: Describe the thermodynamic parameters and their variations in homeostasis of cells and its biomolecules and their interaction with water.

CO 3: Acquire knowledge about preparation of radioisotopes, their applications in studying the cellular metabolic processes.

CO 4: Display skills in problem solving, critical thinking and analytical reasoning as applied to problems in organic and physical chemistry

#### **Subject and code: PS 515.1 PHYSIOLOGY & NUTRITION**

<b>Course Outcomes:</b>
CO 1: Explain the functions of important physiological systems including the cardio-respiratory, reproductive renal, and metabolic systems
CO 2: Explain the integration of the different organs in maintaining homeostasis
CO 3: Discuss diseases, disorders, and conditions that result from a homeostatic imbalance
CO 4: State the role of nutrients, caloric requirements and the deficiency disorders
<b>Subject and code: PS 516.1 GENERAL MICROBIOLOGY</b>
<b>Course Outcomes:</b>
CO 1: Acquire knowledge about the microorganisms around us, development of the discipline of Microbiology and the contributions made by prominent scientists in this field.
CO 2: Differentiate between the useful and harmful microorganisms and explain the structure and functions of microscopic organisms
CO 3: Explain sterilization of media and assessment of sterility.
CO 4: Understand the importance of microorganisms as model systems in genetics and biochemistry.
<b>Subject and code: PS 517.1P ANALYTICAL TECHNIQUES</b>
<b>Course Outcomes:</b>
CO 1: Get hands on training for different types of chromatographic techniques
CO 2: Perform different types of electrophoretic techniques used to separate proteins and analyse the results.
CO 3: Perform various extraction procedures used to extract different molecules from biological samples.
<b>Subject and code: PS 518.1P EXPERIMENTAL MICROBIOLOGY</b>
<b>Course Outcomes:</b>
CO 1: Isolate microbes from provided samples and perform bacterial cultures in different media.
CO 2: Perform routine microbiological practices such as sterilization, media preparation, maintenance of microbial culture, and staining.
CO 3: Culture and screen microbes for antibiotic resistance.
<b>Semester-2</b>
<b>Subject and code: PH 511.2 ENZYMOLOGY</b>
<b>Course Outcomes:</b>
CO 1: Classify and explain the general properties of enzymes
CO 2: Describe and use the equations of enzyme kinetics.
CO 3: Describe the catalytic mechanisms of most well-characterized enzymes
CO 4: Describe the mechanisms of enzyme regulation
CO 5: Explain the applications of enzymes in diagnosis, monitoring, and therapy.
<b>Subject and code: PH 512.2 METABOLISM</b>
<b>Course Outcomes:</b>
CO 1: Describe the metabolism of carbohydrates, and its regulation
CO 2: Describe the metabolism of lipids and its regulation
CO 3: Explain the importance of high energy compounds, electron transport chain, and synthesis of ATP.
CO 4: Explain the integration of carbohydrate and lipid metabolism

CO 5: Correlate synthesis and breakdown of biomolecules with various metabolic disorders
<b>Subject and code: PH.513.2P Practical Enzymology</b>
<b>Course Outcomes:</b>
CO 1: Demonstrate practical understanding of enzyme kinetics and its applications. CO 2: Demonstrate practical applications of monosubstrate and bisubstrate assays and an overall understanding of using various biochemical kinetic reactions for isolating and purifying specific analytes. CO 3: Isolate and purify enzymes using downstream processing CO 4: Conduct quantitative assay of clinically important enzymes
<b>Subject and code: PS 514.2 RESEARCH METHODOLOGY AND ETHICS</b>
<b>Course Outcomes:</b>
CO 1: Demonstrate an understanding of research design, procedures of sampling, data collection, analysis and reporting. CO 2: Describe the appropriate statistical methods required for a particular research design and apply appropriate statistical methods for analyzing one or two variables. CO 3: Display an understanding of imperative issues in research ethics, like responsibility for research, scientific misconduct and ethical evaluation CO 4: Demonstrate awareness on Intellectual property rights and patents
<b>Subject and code: PS 515.2 BIOTECHNOLOGY</b>
<b>Course Outcomes:</b>
CO 1: Explain strain improvement methods, isolation of industrial important microorganisms, different types of fermentation process and different recovery process of the final product formed. CO 2: Demonstrate an understanding of animal cell culture, cell lines, application in tissue engineering and hybridoma technology. CO 3: Explain basic concepts of Plant Biotechnology and its applications in agriculture like micro-propagation, haploid plants, embryo culture, hybrids CO 4: Enlist the applications of microbiology in waste management, environmental pollution control.
<b>Subject and code: PS 516.2. NEUROBIOCHEMISTRY</b>
<b>Course Outcomes:</b>
CO 1: Demonstrate basic understanding of the nervous system and its functions. CO 2: Explain basic concepts of physiology and structure of nervous system CO 3: Describe the nature of neurotransmitters and its role in neuronal signal transmission CO 4: Demonstrate concrete understanding of neuronal processes that involves key aspects of learning and memory.
<b>Subject and code: PS 517.2P PRACTICAL BIOTECHNOLOGY</b>
<b>Course Outcomes:</b>
CO 1: Gain practical knowledge on tissue culture laboratory set-up, sterilization and media preparation CO 2: Perform animal and plant cell culture techniques CO 3: Perform toxicity and cell viability assays on animal tissues and conduct water quality testing
<b>Subject and code: PS 518.2P Experimental Neurobiochemistry</b>

<b>Course Outcomes:</b>
CO 1: Quantify and analyse the effect of drugs/toxins on brain tissue CO 2: Prepare tissue homogenates required for various biological assays and perform biochemical and histological assays to understand neuronal activity CO 3: Evaluate the behavioural changes that take place under conditions of stress and anxiety and apply the information obtained
<b>Subject and code: PO 519.2. Biochemistry of Diseases (Open Elective-I)</b>
<b>Course Outcomes:</b>
CO 1: Demonstrate an understanding of the mechanisms of diseases- cause, transmission, detection, treatment and prevention. CO 2: Understand general health check-ups, diagnosis and samples for disease analysis. CO 3: Relate to any existing or emerging infection as well as will learn about drug resistance and its mechanisms. CO 4: Acquire know-how to health research and develop new tools for their management.
<b>Semester-3</b>
<b>Subject and code: PH 511.3 MOLECULAR BIOLOGY</b>
<b>Course Outcomes:</b>
CO 1: Give an overview of the central dogma of life and the historical discoveries that led to our current understanding of molecular mechanisms of life CO 2: Describe the organization of prokaryotic and eukaryotic chromosome CO 3: Explain the processes of transcription/translation, posttranscriptional/posttranslational modifications. CO 4: Differentiate prokaryotic and eukaryotic gene expression and regulation CO 5: Identify the stages of the cell cycle, and explain the important checkpoints that a cell passes through during the cell cycle
<b>Subject and code: PH 512.3 NITROGEN METABOLISM &amp; PLANT BIOCHEMISTRY</b>
<b>Course Outcomes:</b>
CO 1: Discuss nitrogen metabolism and general mechanisms of amino acid metabolism. CO 2: Describe pathways of degradation of proteins, purines and pyrimidines and Inborn errors of amino acid degradation CO 3: Identify important metabolites in plants and animals that are important to understand the significance of various metabolic pathways. CO 4: Explain the process of photosynthesis; metabolism of photo assimilates and the role of plant hormones. CO 5: Discuss photobiology and stress physiology in plants
<b>Subject and code: PH 513.3P Metabolism and Clinical Biochemistry</b>
<b>Course Outcomes:</b>
CO 1: Demonstrate ability to perform experiments to estimate metabolic parameters. CO 2: Perform microscopic & chemical analysis of Blood & urine CO 3: Analyse and interpret clinical and biochemical changes taking place in blood and urine under normal and pathological conditions.
<b>Subject and code: PH 514.3P CELL &amp; MOLECULAR BIOLOGY</b>
<b>Course Outcomes:</b>
CO 1: Evaluate and apply knowledge of modern techniques in cellular biology for observation and identification of tissues and cells

CO 2: Extract DNA, RNA and perform their analysis at molecular level.
CO 3: Learn the different phases of cell division using molecular techniques.
CO 4: Handle, maintain <i>Drosophila melanogaster</i> and perform experiments related to the model organism
<b>Subject and code: PS 515.3 CELLULAR BIOCHEMISTRY</b>
<b>Course Outcomes:</b>
CO 1: Outline the structure of various cellular organelles and describe the relationship between various cellular structures and their corresponding functions.
CO 2: Describe the structure and properties of biological membranes and the processes of transport across cell membranes.
CO 3: Discuss the general principles of cell communication and cell signaling.
CO 4: Describe various cellular signal transduction pathways, specifically muscle contraction.
<b>Subject and code: PS 516.3. CLINICAL BIOCHEMISTRY</b>
<b>Course Outcomes:</b>
CO 1: Understand the basic concepts and principles of Clinical Biochemistry, detail on the collection, preservation and storage of biological samples
CO 2: Explain principles of laboratory automation and quality control in a clinical laboratory
CO 3: Describe the different biochemical tests carried out in blood and urine for the diagnosis and prognosis of various disease conditions.
CO 4: Clinically assess the laboratory indicators of physiologic conditions and diseases
<b>Subject and code: PO 517.3 EVOLUTION AND ECOLOGY</b>
<b>Course Outcomes:</b>
CO 1: Discuss the scientific theory of evolution and explain the points of the Modern Synthesis of evolutionary theory.
CO 2: Demonstrate broad-based knowledge of the fundamentals of Ecology, and Evolution and the relationships among these disciplines
CO 3: Describe the principal interactions between different species and how they affect the respective species.
CO 4: Discuss the biogeochemical cycles, pollution, natural resource conservation and management
<b>Semester-4</b>
<b>Subject and code: PH 511.4 IMMUNOLOGY</b>
<b>Course Outcomes:</b>
CO 1: Define central immunological concepts and demonstrate basic knowledge of immunological processes at a cellular and molecular level.
CO 2: Describe the cells and organs involved in immune response and compare and contrast innate and adaptive immunity
CO 3: Elaborate on the concept of antigen, immunoglobulins and apply basic techniques for identifying antigen-antibody interactions.
CO 4: Outline key events in antigen presentation, and the cell-mediated and humoral immune responses.
CO 5: Explain the basis of immunological tolerance, autoimmunity, hypersensitive reactions, cancer immunology and principles governing vaccination.
<b>Subject and code: PH 512.4. GENETICS</b>
<b>Course Outcomes:</b>

CO 1: Describe basic concepts of classical Genetics, Mendelian inheritance, extrachromosomal inheritance, sex-linked inheritance and population genetics

CO 2: Elaborate on the concept of gene, genome organization, linkage and genetic mapping and recombination.

CO 3: Discuss the different organisms used as models for studies in genetics

CO 4: Comparing and contrasting different mutation and DNA repair mechanisms and relate variations in chromosome structure and number to phenotypic variation.

CO 5: Describe the relationship between cell cycle and cancer and summarize the mechanism of transformation of cells

**Subject and code: PH 513.4P PROJECT WORK**

**Course Outcomes:**

CO 1: Demonstrate and understanding on the scope of research in their assigned dissertation research topic, troubleshoot, and successfully outline the aims and objectives for subsequent dissertation work.

CO 2: Critically review literature, find gaps in research, select a research problem/ test hypothesis and design experiments.

CO 3: Perform experiments, collect data, draw conclusions and interpret the results and discuss the work in the light of work previously done by other researchers.

CO 4: Communicate in oral and written form by integrating data and interpretation and relate to the concept of ethics in research

**Subject and code: PS 514.4 GENETIC ENGINEERING AND BIOINFORMATICS**

**Course Outcomes:**

CO 1: Acquire knowledge about the advances in modification, and recombination of DNA or other nucleic acid molecules to modify an organism.

CO 2: Enlist the vectors used in genetic engineering and discuss their application

CO 3: Discuss tools and techniques of genetic engineering like transformation, hybridization, transcriptome analysis, sequencing and more.

CO 4: Describe and use the biological databases, perform structured query, data retrieval and analyse and discuss the results

**Subject and code: PS 514.4 CLINICAL TOXICOLOGY**

**Course Outcomes:**

CO 1: Describe the general principles of clinical toxicology and discuss factors that influence toxicity.

CO 2: Explain the basics of pharmacodynamics, pharmacokinetics and PK/PD correlation.

CO 3: Recognize system-specific and organ-specific toxic effects and discuss metabolism of toxicants

CO 4: Describe pharmacological actions, uses & adverse effects of drugs

**Subject and code: PS 516.4 FOOD BIOCHEMISTRY**

**Course Outcomes:**

CO 1: Discuss the concept of food and nutrition

CO 2: Enlist macro- and micronutrients, their sources and functions in the human body.

CO 3: Explain the concept of nutraceuticals and their role in treatment and prevention of various disease conditions

CO 4: Discuss the biochemical changes caused by microorganisms in context of fermented food and food spoilage

**Subject and code: PS 517.4P Methods in Genetic Engineering and Bioinformatics**

**Course Outcomes:**

CO 1: Learn to use tools and techniques in genetic engineering
CO 2: Demonstrate and explain transformation techniques and selection of transformants
CO 3: Perform biological database search, retrieve data and analyse the data employing various bioinformatics tools
<b>Subject and code: PS 518.4P EXPERIMENTS IN FOOD SCIENCE</b>
<b>Course Outcomes:</b>
CO 1: Explain principles behind analytical techniques associated with food.
CO 2: Perform various food analysis techniques and interpret the results
CO 3: Identify the biochemical component of various foods and assess the nutritive value of food sample.

<b>Department Name:</b>	<b>P 520 M.Sc. (Bioinformatics)</b>
<b>PROGRAMME OUTCOMES</b>	
PO1 To prepare software professional with expertise in system design principals and development. PO2 Identify, understand and analyze scientific problems to formulate substantiated conclusions using first principles of mathematics, natural sciences, and applied sciences. PO3 Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations PO4 Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. PO5 Understand the impact of the professional software engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. PO6 Apply ethical principles and commit to professional ethics and responsibilities and norms of the scientific practice. PO7 Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings PO8 Communicate effectively on complex activities with the scientific community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
PEO1 Communicate Software Technology concepts, designs, and solutions effectively and professionally with real life examples and experiences. PEO2 Apply knowledge of computing to bring out effective designs and solutions for specific problems across various domains. PEO3 Ability to use various software development tools, multiple software systems, and modern computing platforms, with priority on the emerging technologies. PEO4 Comprehend the advances of technology in light of its impact on society and the social, legal, ethical and cultural ramifications of computer technology and their usage.	
<b>Semester-1</b>	
<b>Subject and code: PH 521.1: BIOINFORMATICS AND BIOLOGICAL DATABASES</b>	
<b>Course Outcomes:</b>	

<ul style="list-style-type: none"> <li>• understand fundamental concepts in bioinformatics</li> <li>• have an overview of the most important methods and tools that are used</li> <li>• understand how some of the basic methods for biological sequence analysis works</li> <li>• appreciate the need for methods to be accurate and efficient to implement some of the algorithms</li> <li>• be capable of performing simple sequence analyses using existing tools</li> </ul>
<b>Subject and code: PH 522.1: COMPUTATIONAL AND STRUCTURAL BIOLOGY</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Be fluent in using data structures and algorithms to design programs that model basic computational problems in life sciences related to sequence, structure and function of biological entities</li> <li>• Have substantial knowledge of discrete mathematics issues useful in modeling living systems</li> <li>• Apply appropriate techniques to deal with complexity of problems and complexity of programs</li> <li>• Be able to apply this knowledge to independently model fundamental concepts in life sciences such as gene and their product annotation and protein-protein interaction</li> </ul>
<b>Subject and code: PH 523.1 : METABOLISM AND IMMUNOLOGY</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Demonstrate a comprehensive and practical understanding of basic immunological principles</li> <li>• Differentiate between innate and adaptive immunity.</li> <li>• Explain the mechanisms and differences between primary and secondary responses and their relevance to immunizations.</li> <li>• Identify the role of antigen presenting cells, lymphocytes, and phagocytic cells in immune responses.</li> </ul>
<b>Subject and code: PH 524.1: CELL AND MOLECULAR BIOLOGY</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Describe the chemical components of the macromolecules of life and their functions</li> <li>• Describe the structural differences between prokaryotic and eukaryotic cells or between plant and animal cells</li> <li>• Classify living organisms within taxonomic groups</li> <li>• Explain the differences and similarities between photosynthesis and cellular respiration</li> <li>• Predict the outcome of a reaction catalyzed by enzymes under different conditions</li> <li>• Apply the concepts of replication, transcription and translation</li> </ul>
<b>Subject and code: PH 525.1P                      BIOINFORMATICS AND COMPUTATIONAL BIOLOGY LAB</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Understand the principles and some methods of genomics, gene expression and proteomics</li> <li>• Understand the concepts of the new, high-throughput and high-noise biology.</li> <li>• Search large databases, interpret their results.</li> <li>• Analyze gene expression using data from microarrays or RNA sequencing.</li> <li>• Analyze metabolomic, proteomics, and protein-protein interaction experiments</li> </ul> <p>Learning Outcomes: After this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Implement computational methods to solve problems involving measurement data.</li> </ul>

<ul style="list-style-type: none"> <li>•Perform data acquisition from raw data.</li> <li>•Independently search for information and available methods to solve practical problems.</li> <li>•Present results, methods and conclusions in written and oral reports.</li> </ul>
<b>Subject and code: PS 526.1 : PROGRAMMING: JAVA &amp; DATABASES FOR BIOINFORMATICS</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>•Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.</li> <li>•Identify classes, objects, members of a class and the relationships among them needed for a specific problem.</li> <li>•Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring</li> <li>•Develop programs using the Java Collection API as well as the Java standard class library.</li> </ul>
<b>Subject and code: PS 527.1P PROGRAMMING: JAVA and DBMS LAB</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>•Create databases using popular database management system products</li> <li>•Solve problems by constructing database queries using the Structured Query Language</li> <li>•Develop insights into future data management tool and technique trends</li> <li>•Recommend and justify strategies for managing data security, privacy, audit/control, fraud detection, backup and recovery</li> <li>•Comprehend the art of programming and, the structure and meaning of basic Java programs,</li> <li>•Design and build programs using problem-solving techniques such as top-down design,</li> <li>•Modify, compile, debug, and execute Java programs,</li> <li>•Understand how to create graphical interfaces and Java applets for a Web page.</li> </ul>
<b>Subject and code: RESEARCH PROJECT – I</b>
<b>Course Outcomes:</b>
<p>Objectives: To give the Masters student experience and training in bioinformatics research through a high quality research project either in industry or academia. To understand and experience:</p> <ol style="list-style-type: none"> <li>1. The technical skills required for efficient bioinformatics research;</li> <li>2. The organisation and implementation of research;</li> <li>3. Working to deadlines and as part of a team;</li> <li>4. The skills required to record, report and write up original scientific research.</li> </ol>
<b>Semester-II</b>
<b>Subject and code: PH 521.2 : GENOMICS AND PROTEOMICS</b>
<b>Course Outcomes:</b>
<b>Subject and code:</b>
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<b>Subject and code: PH 522.2 : MOLECULAR MECHANICS AND SIMULATION</b>	
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>•explain the foundations and concepts of statistical mechanics such as canonical distributions, ensembles and partition functions, as well as the statistical mechanical description of ideal and non-ideal gases and simple liquids</li> <li>•account for the molecular mechanical description for interacting systems , including the theoretical basis behind force fields, intra molecular and intermolecular interactions</li> <li>•connect the theoretical basis with its implementation in computational methods such as molecular dynamics simulations, energy optimisation, Monte Carlo and free energy calculations based on thermodynamics cycles</li> <li>•use computer modelling methods for analysing bio molecular structure, function and dynamics.</li> </ul>	
<b>Subject and code: PH 523.2P                      MOLECULAR MECHANICS AND GENOMICS LAB</b>	
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>•Be able to develop and apply algorithms for structural bioinformatics ;</li> <li>•Be able to implement algorithms related to Biomechanics and Biomolecular Systems</li> <li>•To develop practical skills in computational approaches to analyze, predict, and engineer biomolecules</li> </ul>	
<b>Subject and code: PS 524.2: BIOSTATISTICS</b>	
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>• Calculate descriptive statistics related to Bioinformatics.</li> <li>• Evaluate the utility of bivariate analysis methods given a data set.</li> <li>• Calculate bivariate analyses &amp; interpret the results of bivariate analyses.</li> <li>• Calculate multivariate analyses to determine association among variables.</li> <li>• Interpret the results of multivariate analyses and evaluate analysis results by testing hypotheses.</li> </ul>	
<b>Subject and code: PS 525.2 : PERL-CGI and BIOPERL PROGRAMMING</b>	
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>•Experience learning a programming language "on your own" as is commonly the case in industry.</li> <li>•Understand the syntax and semantics of the Perl language and their similarity and differences from Java</li> <li>•Understand how to develop and implement various types of programs in the Perl language.</li> <li>•Understand various forms of data representation and structures supported by the Perl language</li> <li>•Understand the appropriate applications of the Perl language</li> </ul>	
<b>Subject and code: PS 526.2P                      PROGRAMMING : PERL-CGI &amp; BIOSTATISTICS Lab</b>	
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>• Understanding of basic Perl and ability to apply prerequisite basic programming concepts to Perl</li> <li>• Write, compile, and run Perl programs, Analyze the effects of using Perl structures that implement decisions, loops, and store arrays and use these structures in a well-designed, OOP program.</li> <li>• Create Perl programs that make use of various directories and use several files linked together.</li> </ul>	
<b>Subject and code: PO 527.2: BIOETHICS, BIOSAFETY AND IPR</b>	

<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• To present the basic concepts, principles, and elements of ethics</li> <li>• To formulate the ethical principles relevant to Life Sciences, and related areas of concern</li> <li>• To discuss the nature of specific practices, and to consider how these modify the application of moral principles</li> </ul>
<b>Subject and code: RESEARCH PROJECT – II</b>
<b>Course Outcomes:</b>
<p>Objectives: To give the Masters student experience and training in bioinformatics research through a high quality research project either in industry or academia. To understand and experience:</p> <ul style="list-style-type: none"> <li>• The technical skills required for efficient bioinformatics research;</li> <li>• The organisation and implementation of research;</li> <li>• Working to deadlines and as part of a team;</li> <li>• The skills required to record, report and write up original scientific research.</li> </ul>
<b>Semester-III</b>
<b>Subject and code: PH 521.3 : SYNTHETIC BIOLOGY AND DRUG DESIGN</b>
<b>Course Outcomes:</b>
<p>Learning Outcome: On completion of the course, the student should be able to:</p> <ul style="list-style-type: none"> <li>•Importance of the various disciplines involved in the different phases of drug discovery and development.</li> <li>•Explain scientific, ethical and market-related considerations of importance in the drug development.</li> <li>•Carry out searches in databases to retrieve information relevant to the development of a new drug.</li> <li>•Account for decision points in the drug development process.</li> <li>•Explain how methods for predictions are used to make early decisions in the drug discovery and development.</li> </ul>
<b>Subject and code: PH 522.3 : SYSTEMS BIOLOGY AND METABOLIC ENGINEERING</b>
<b>Course Outcomes:</b>
<p>Learning Outcome: At the end of the course student will be be able to:</p> <ul style="list-style-type: none"> <li>•Geenomic, transcriptomic and proteomic techniques work, and discuss their strengths and limitations.</li> <li>•Interpret the results of biological studies that make use of these techniques.</li> <li>•Take the raw outputs of these techniques and perform basic data processing and analysis.</li> <li>•Use the R language to perform basic statistical and graphical analyses</li> <li>•Write basic scripts and pipelines for automating and repeating analyses</li> </ul>
<b>Subject and code: PH 523.3P                      SYSTEMS BIOLOGY AND DRUG DESIGN LAB</b>
<b>Course Outcomes:</b>
<p>Learning Objectives: The specific objectives include:</p> <ul style="list-style-type: none"> <li>•Learning the Principles of Systems Biology; Standard models and approaches.</li> <li>•To understand signal transduction and other biological processes; modeling of gene expression.</li> <li>•To understand modeling of evolution and self organization.</li> <li>•In silico docking/scoring; ADME and Toxicity prediction; Pharmacophore modeling</li> </ul>
<b>Subject and code: PS 524.3: BIG DATA ANALYTICS FOR BIOINFORMATICS</b>

<b>Course Outcomes:</b>
<p>Learning Outcomes : At the end of this course, the student will</p> <ul style="list-style-type: none"> <li>• Become familiar with the fundamental concepts of Big Data management and analytics;</li> <li>• Will become competent in recognizing challenges faced by applications dealing with very large volumes of data as well as in proposing scalable solutions for them;</li> <li>• Will be able to understand how Big Data impacts business intelligence, scientific discovery, and our day-to-day life.</li> </ul>
<b>Subject and code:PS 525.3: PROGRAMMING : PYTHON FOR BIOINFORMATICS</b>
<b>Course Outcomes:</b>
<p>Learning Outcomes : Upon successful completion of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Modify and extend legacy Python code to carry out the desired analysis, management, and manipulation of genetic, proteomic, and related biological data.</li> <li>• Implement dynamic programming algorithms to support the analysis of biological related data.</li> <li>• Understand commonly used Python algorithms and modules related to implementing algorithms</li> <li>• Implement the data structures that support the algorithms to retrieve and manipulate biological data from genomic and proteomic databases.</li> <li>• Carry out preliminary computation-based bioinformatics research</li> </ul>
<b>Subject and code:PS 526.3P                      PROGRAMMING: PYTHON AND BIG DATA Lab</b>
<b>Course Outcomes:</b>
<p>Learning Outcome: Upon completion of the subject, students will be able to</p> <ul style="list-style-type: none"> <li>• Understanding the basic concepts of Python &amp; Preparing and pre-processing data</li> <li>• Understanding the data aggregation and grouping concepts</li> <li>• Leveraging web scraping and Visualizing the results of analytics effectively</li> </ul>
<b>Subject and code:PO 527.3: GENETIC COUNSELING</b>
<b>Course Outcomes:</b>
<p>Learning Outcomes: Upon successful completion of this course, a student will be able to:</p> <ul style="list-style-type: none"> <li>• Be aware that certain conditions or diseases can have genetic causes</li> <li>• Have clinical applicable knowledge in genetics with a focus on genetic guidance.</li> <li>• Have knowledge about how genetic diseases influence both individual and family as society.</li> </ul>
<b>Subject and code:DOMAIN KNOWLEDGE PROJECT</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Gather, organize, summarize and interpret literature with the purpose of formulating a proposal.</li> <li>• Write a technical report summarizing state-of-the-art on an identified topic.</li> <li>• Present the study using graphics and multimedia techniques.</li> <li>• Define intended future work based on the technical review.</li> </ul>
<b>Semester-IV</b>
<b>Subject and code:PH 521.4 : INDUSTRY INTERNSHIP / PROJECT WORK / DISSERTATION</b>
<b>Course Outcomes:</b>
<p>Learning Objectives:</p> <p>To provide students with an opportunity to gain work experience that will enhance and complement their academic learning. The course requirements are designed to provide a</p>

structure that will enable students to make connections between what they learn in the classroom and on the job, to further develop analytical and interpersonal skills, and to practice business writing skills.

**Subject and code: PS 522.4 : DOMAIN KNOWLEDGE PROJECT**

**Course Outcomes:**

The purpose of a thesis is to enable the student to develop deeper knowledge, understanding, capabilities and attitudes in the context of the programme of study. The thesis offers the opportunity to delve more deeply into and synthesise knowledge acquired in previous studies. A thesis for a Domain Knowledge should place emphasis on the technical/scientific/artistic aspects of the subject matter.

The overall goal of the thesis is for the student to display the knowledge and capability required for independent work as a Master of Science in Software Technology.

Learning objectives for a thesis are based on the objectives for Master of Science in Bioinformatics has Specific learning outcomes: for the student to demonstrate:

- Considerably more in-depth knowledge of the major subject/field of study, including deeper insight into current research and development work.
- Deeper knowledge of methods in the major subject/field of study.
- A capability to contribute to research and development work.
- The capability to use a holistic view to critically, independently and creatively identify, formulate and deal with complex issues.
- The capability to plan and use adequate methods to conduct qualified tasks in given frameworks and to evaluate this work.
- The capability to create, analyse and critically evaluate different technical/architectural solutions.
- The capability to critically and systematically integrate knowledge.
- The capability to clearly present and discuss the conclusions as well as the knowledge and arguments that form the basis for these findings in written and spoken English.
- The capability to identify the issues that must be addressed within the framework of the specific thesis in order to take into consideration all relevant dimensions of sustainable development.
- A consciousness of the ethical aspects of research and development work.

<b>Department Name:</b>	<b>P 530 M.Sc. (Software Technology)</b>
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**PROGRAMME OUTCOMES**

- PEO1: Communicate Software Technology concepts, designs, and solutions effectively and professionally with real life examples and experiences.
- PEO2: Apply knowledge of computing to bring out effective designs and solutions for specific problems across various domains.
- PEO3 : Ability to use various software development tools, multiple software systems, and modern computing platforms, with priority on the emerging technologies.
- PEO4 :Comprehend the advances of technology in light of its impact on society and the social, legal, ethical and cultural ramifications of computer technology and their usage.

**PROGRAMME SPECIFIC OUTCOMES**

PO1 To prepare software professional with expertise in system design principals and development.

PO2 Identify, understand and analyze scientific problems to formulate substantiated conclusions using first principles of mathematics, natural sciences, and applied sciences.

PO3 Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO4 Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 Understand the impact of the professional software engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO6

Apply ethical principles and commit to professional ethics and responsibilities and norms of the scientific practice.

PO7 Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

PO8 Communicate effectively on complex activities with the scientific community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO9 Demonstrate knowledge understanding of the scientific and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO10 Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.

**Subject and code: PH 531.1 DATA STRUCTURES AND ANALYSIS OF ALGORITHMS**

**Course Outcomes:**

Course Outcomes: On successful completion of the course students will be able:

- To program using structures, function pointers, classes and objects.
- To implement and apply stack, queue and list data structures in different applications.
- To program binary tree, binary search tree, AVL tree and other tree data structures and traverse and represent expressions using tree data structure.
- To program different searching and sorting algorithms using c++ programming language, and also able to select suitable techniques based on the situation
- To create graph using array and using linked list. Ability to find shortest path in graph, able to traverse the graph

**Subject and code: PH 532.1 RELATIONAL DATABASE MANAGEMENT SYSTEMS**

**Course Outcomes:**

Course Outcomes: On successful completion of the course students will be able:

- Have good understanding about data and database systems. Describe the fundamental elements of relational database management systems.

- Understand the design of relational databases through the use of Entity-Relationship Diagrams and Normalization procedures and Develop basic skills in the use of SQL in defining and creating a database, inserting and modifying entries in a table.
- Gain Knowledge about Transaction, concurrency control and Lock management for database design.
- Have awareness about how data is stored in different storage media and how data is indexed.
- Prepare the students to understand the power of Query languages and also write PL/SQL transactions and to create different data objects.

**Subject and code:PH 533.1 OBJECT ORIENTED PROGRAMMING WITH JAVA**

**Course Outcomes:**

Course outcomes: After completing the course, the student should develop:

- An ability to understand the Object Oriented Concepts well and relate it with real world problems, develop solutions with programming constructs
- An understanding on classes, objects, methods, attributes, constructors and arrays and also write efficient programs using these concepts
- An ability to do string manipulation, understand and apply reusability using inheritance and also use Interfaces for efficient programming
- An understanding and clear knowledge about Exceptions and Exception handling, File I/O streams and also collection frameworks
- An ability to develop and understand multithreaded

**Subject and code:PH 534.1 : WEB DESIGN WITH PHP and MYSQL**

**Course Outcomes:**

Course Outcomes: The Candidate will be able

- To use knowledge of HTML and CSS code and an HTML editor to create personal and/or business websites following current professional and/or industry standards. Use critical thinking skills to design and create websites.
- To create effective scripts using JavaScript.
- To enhance the end user experience using JQuery.
- Students can be employed on entry-level jobs of PHP based web development in software industry
- To develop interactive and dynamic website using PHP and database connectivity.

**Subject and code:PS 537.1 SOFTWARE ENGINEERING WITH UML**

**Course Outcomes:**

Course outcomes: Upon Completion of this course, students should be able to:

- Plan and deliver an effective software engineering process, based on development lifecycle models.
- Make effective use of UML, along with design strategies such as defining a software architecture, separation of concerns and design patterns.
- Capture, document, analyze requirements and translate a requirements specification into an implementable design, a structured and organized process.
- Understanding the different system design concepts such as coupling, cohesion and architectural styles.
- Formulate a testing strategy for a software system, employing techniques such as unit testing, test driven development and functional testing.

**Semester-II**

**Subject and code:PH 531.2 PROGRAMMING WITH PYTHON**

<b>Course Outcomes:</b>
<p>Course Outcomes: At the end of this course students would have learned</p> <ul style="list-style-type: none"> <li>• To design and program Python applications, use lists, tuples, and dictionaries in Python programs.</li> <li>• To identify Python object types, use indexing and slicing to access data in Python programs.</li> <li>• To build and package Python modules for reusability and to read and write files in Python.</li> <li>• To design object oriented programs with Python classes and use class inheritance in Python for reusability.</li> <li>• To use exception handling in Python applications for error handling.</li> </ul>
<b>Subject and code:PH 532.2 MOBILE APPLICATION DEVELOPMENT WITH ANDROID</b>
<b>Course Outcomes:</b>
<p>Course Outcomes: Students must be able to</p> <ul style="list-style-type: none"> <li>• Understand the architecture, working and environmental setup of Android</li> <li>• Design and Implement simple GUI based Android Apps that handle user input and provide information</li> <li>• Implement Android apps that are able to receive broadcasted messages, act as content provider or receiver and run background services.</li> <li>• Create Android Apps that can manipulate data from various data stores such as internal, external memory and also SQLite as a Database.</li> <li>• Design and Work with advanced sensors of the phone and manipulate Telephony.</li> </ul>
<b>Subject and code:PS 534.2 E1 FOUNDATIONS OF DATA SCIENCE</b>
<b>Course Outcomes:</b>
<p>Course outcomes: On completion of the course the students will be able to</p> <ul style="list-style-type: none"> <li>• Select appropriate statistical techniques for summarizing and displaying of data.</li> <li>• Identify outliers and use the right techniques to treat them in order to give a better understanding of the data.</li> <li>• Analyze and draw inferences from data using appropriate statistical methods.</li> <li>• Perform correlation and regression, and be able to make predictions and interpret the results</li> <li>• Identify the types of learning and apply the appropriate tools to derive information from the data.</li> </ul>
<b>Subject and code: PS 534.2 E2 DATA WAREHOUSING AND DATA MINING</b>
<b>Course Outcomes:</b>
<p>Course Outcomes: By the end of the module, the student should</p> <ul style="list-style-type: none"> <li>☐ Understand and implement classical models and algorithms in data warehouses.</li> <li>☐ Display a comprehensive understanding of different data mining tasks and the algorithms most appropriate for addressing them.</li> <li>☐ Evaluate models/algorithms related to Association rule mining with respect to their accuracy.</li> <li>☐ Perform a self directed piece of practical work that requires the application of data mining techniques in classification and prediction.</li> <li>☐ Conceptualize a data mining solution to a practical problem in clustering and outlier analysis.</li> </ul>
<b>Subject and code: PS 535.2 E1 ARTIFICIAL INTELLIGENCE AND COGNITIVE COMPUTING</b>
<b>Course Outcomes:</b>

<p>Course Outcomes: By the end of the module, the student should be able</p> <ul style="list-style-type: none"> <li>• To Design intelligent agents for problem solving, reasoning and planning.</li> <li>• To implement AI systems with different approaches of knowledge representation, design AI systems with heuristic search techniques</li> <li>• To implement AI systems using statistical and symbolic reasoning, designing AI models using Bayes rule</li> <li>• Apply AI technique on current applications with cognitive psychology using connectionist approach</li> <li>• To design applications using computational cognitive neuroscience by applying techniques of cognitive computing and neural network theory.</li> </ul>
<b>Subject and code:PS 535.2 E2 MACHINE LEARNING AND DEEP LEARNING</b>
<p><b>Course Outcomes:</b></p> <p>Course Outcomes: By the end of the module, the student should be able</p> <ul style="list-style-type: none"> <li>• To implement Machine Learning with Bayes algorithm, to work out the concept of dimensionality reduction using PCA &amp; LDA</li> <li>• To implement Machine Learning with SVM, Decision tree and clustering methods</li> <li>• To use MLP, HMM for classification and also to measure the performance of the classification algorithm, to design models using reinforcement learning</li> <li>• To implement CNN and RNN for Deep Learning models by applying all the methods for creating optimal model</li> <li>• To implement Transfer learning and Auto encoders for Deep Learning models</li> </ul>
<b>Subject and code:PO 537.2 (E1): ENTERPRISE INFORMATION SYSTEMS</b>
<p><b>Course Outcomes:</b></p> <p>Course Outcomes : Upon successful completion of this course, a student will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the enterprise need of integrating information assets, and be able to articulate</li> <li>• the advantages and tradeoffs of different information integration designs of organizations.</li> <li>• Understand the key components of Enterprise Information Systems such as Enterprise</li> <li>• Resource Planning, Customer Relationship Management, Supplier Relationship</li> <li>• Management and Business Intelligence.   Understand the key issues in implementing and managing EIS.</li> <li>• Understand the emerging business models of enterprise system vendors</li> </ul>
<b>Subject and code:PO 537.2 (E2): MARKETING ANALYTICS</b>
<p><b>Course Outcomes:</b></p> <p>Course Outcomes: Students who complete this course will be able to</p> <ul style="list-style-type: none"> <li>• Have a high- level understanding of the benefits and objectives of marketing analytics.</li> <li>• Apply metrics -driven techniques to improve marketing decisions.</li> <li>• Understand best practices through case studies.</li> <li>• Learn by doing through hands-on computer spreadsheet models and metric</li> <li>• Design and analyze appropriate predictive models.&amp; apply statistical tools for analysis</li> </ul>
<b>Subject and code:Research Methodology and Ethics</b>
<p><b>Course Outcomes:</b></p> <p>Course Outcomes:</p>

<ul style="list-style-type: none"> <li>• Research output with philosophical base and greater relevance to the society</li> <li>• Quality research with scientific methodology</li> <li>• Production of good Research Reports</li> <li>• Original Research following ethical guidelines and practices in conducting the research and publication of papers.</li> <li>• More awareness on Intellectual property Rights and Patents.</li> </ul>
<b>Semester-III</b>
<b>Subject and code:PH531.3 CLOUD COMPUTING WITH AMAZON WEB SERVICES</b>
<b>Course Outcomes:</b>
<p>Course Outcomes: By the end of the module, the student should be able</p> <ul style="list-style-type: none"> <li>• Describe the key technologies, architecture, strengths, limitations and applications of cloud computing</li> <li>• Explain the types and service models of cloud and Understand security implications in cloud computing</li> <li>• Design Cloud Services and Set a private cloud</li> <li>• Create and automate infrastructure to design cost-effective, highly available applications</li> <li>• Integrate AWS services with your application to meet and exceed non-functional requirements</li> </ul>
<b>Subject and code:PH 532.3: WEB TECHNOLOGIES and .NET FRAMEWORK</b>
<b>Course Outcomes:</b>
<p>Course Outcomes: By the end of the module, the student should be able</p> <ul style="list-style-type: none"> <li>•Learn to develop correct, well documented programs using C# programming language.</li> <li>•Create visually rich and attractive Web applications with ASP.NET controls and controls in the AJAX Control Toolkit</li> <li>•Display dynamic data from a data source by using Microsoft ADO.NET, LINQ and EF.</li> <li>•Create MVC Models and write code that implements business logic within Model methods, properties, and events.Dynamic web applications, create and consume web services,understand the Microsoft Web Technologies stack.</li> <li>•Write an application that can create, edit, and view data from a database using ASP.Net Core, and create Sing</li> </ul>
<b>Subject and code: PS 534.3 E1 INTERNET OF THINGS and APPLICATIONS</b>
<b>Course Outcomes:</b>
<p>Course Outcomes – upon successful completion of this course, the participant will be able to:</p> <ul style="list-style-type: none"> <li>• Understand why IoT is used and how it is implemented and how networks and communication is used to implement IoT</li> <li>• Understand how identity management models are used in IoT, also understand why trust management is important for IoT environment</li> <li>• Understand the use of protocols which are used in different layers and how it is combined with other protocols down the layers to carry out the communication</li> <li>• Understand how data is stored in cloud and how it is represented using different application to carry out or execute different data analytics tools</li> <li>• Understand the concepts of data science for IoT analytics, how to organize data for analytics, and how to get benefits from IoT analytical tools.</li> </ul>
<b>Subject and code: PS 534.3 E2 NATURAL LANGUAGE PROCESSING</b>

<b>Course Outcomes:</b>
<p>Course Outcomes: upon successful completion of this course, the participant will be able to:</p> <ul style="list-style-type: none"> <li>☑Ability to create morphemes and perform morphological analysis. Construct simple DFA. Perform POS tagging</li> <li>☑Ability to construct parse trees for sentences when CFG is given. Perform leftmost and rightmost derivations. Perform top-down and bottom-up parsing. Perform ambiguity analysis and word sense disambiguation.</li> <li>☑Perform reference resolution on sentences. Differentiate Cohesion and Coherence.</li> <li>☑Differentiate pipelined, interleaved and integrated architecture of NLG.</li> </ul>
<b>Subject and code: PS535.3 E1 BIG DATA ANALYTICS WITH SCALA AND SPARK</b>
<b>Course Outcomes:</b>
<p>Course Outcomes: Upon successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Understand what Functional programming is and will know why classical data analysis techniques are no longer adequate</li> <li>• Understand the benefits that Spark and Spark SQL offers for processing structured and unstructured data.</li> <li>• Understand conceptually how Spark SQL is used for Data Exploration, Data Munging and Data Streaming.</li> <li>• Understand how Spark can be used for Machine Learning.</li> <li>• Understand the use of PySpark and Sparkr</li> </ul>
<b>Subject and code: PS 535.3 E2: BIG DATA ANALYTICS with MAP REDUCE &amp; HADOOP</b>
<b>Course Outcomes:</b>
<p>Course Outcomes : Upon Completion of the course, the students will be able to</p> <ul style="list-style-type: none"> <li>• Identify and distinguish big data analytics applications from other applications and the use of Big Data.</li> <li>• Describe No SQL databases and understanding different concepts related to No SQL and its applications using MongoDB.</li> <li>• Understanding Hadoop and its advantage over the traditional database applications in solving practical problems</li> <li>• Writing programs using mapper and reducer.</li> <li>• Using Hive and Pig for analyzing and querying data and knowing the advantages over the traditional Data handling solutions.</li> </ul>
<b>Subject and code: PO537.3 E1 SOCIAL MEDIA ANALYTICS</b>
<b>Course Outcomes:</b>
<p>Course Outcomes: Upon successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Apply multiple quantitative and qualitative methods</li> <li>• Understand sources and limitations of web-based data</li> <li>• Perform social network analysis to identify important social actors, subgroups and network properties in social media.</li> <li>• Use appropriate information visualization technique to gain insights into large datasets</li> <li>• Apply best practices in Search Engine Optimization</li> </ul>
<b>Subject and code: PO537.3 E2 STREAMING ANALYTICS</b>
<b>Course Outcomes:</b>

Course Outcomes: Upon successful completion of this course, the student will be able to:

- Describe and use a wide variety of streaming analytics methods in a business or an industry.
- Understand how analytics can be used in business development using Kafka and Flume.
- Learn to use and to apply a selection of modern business analytics tools and software to solving real-world problems with real-world data
- Demonstrate hands-on skills using visualization in applying business analytics
- Demonstrate hands-on skills in applying analytics into real-world business using statistical approximation and sketching.

#### Semester-IV

#### Subject and code: DOMAIN KNOWLEDGE PROJECT

#### Course Outcomes:

Learning objectives for a thesis are based on the objectives for Master of Science in Software Technology has Specific learning outcomes: for the student to demonstrate:

- Considerably more in-depth knowledge of the major subject/field of study, including deeper insight into current research and development work.
- Deeper knowledge of methods in the major subject/field of study.
- A capability to contribute to research and development work.
- The capability to use a holistic view to critically, independently and creatively identify, formulate and deal with complex issues.
- The capability to plan and use adequate methods to conduct qualified tasks in given frameworks and to evaluate this work.
- The capability to create, analyse and critically evaluate different technical/architectural solutions.
- The capability to critically and systematically integrate knowledge.
- The capability to clearly present and discuss the conclusions as well as the knowledge and arguments that form the basis for these findings in written and spoken English.
- The capability to identify the issues that must be addressed within the framework of the specific thesis in order to take into consideration all relevant dimensions of sustainable development.
- A consciousness of the ethical aspects of research and development work.

<b>Department Name:</b>	<b>P 540 M.Sc. (Analytical Chemistry)</b>
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#### PROGRAMME OUTCOMES

- PO 1: Inculcate critical thinking to carry out scientific investigation objectively in industry and academia by following scientific approach to knowledge development.
- PO 2: Equip the student with necessary skills to analyse scientific problems, formulate hypothesis, evaluate and validate results, and draw conclusions from the data obtained
- PO 3: Equip the student with the knowledge for clear understanding of the subject related concepts to lead them for interdisciplinary and trans disciplinary research
- PO 4: Induce the sense of professional and ethical responsibility and enhance the cross cultural competency

PO 5: Demonstrate an understanding of major concepts in all disciplines of chemistry  
 PO 6: Get an awareness of the impact of chemistry on the environment, society, and other cultures outside the scientific community

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO 1: Apply advanced concepts of organic, analytical, physical and inorganic chemistry to solve complex problems of industry and academia  
 PSO 2: Design experiments, analyse and interpret data to provide solutions to various industrial glitches by working in the pure, inter and multi-disciplinary areas of chemical sciences.  
 PSO 3: Able to independently carry out research / investigation to solve practical problems and write / present a substantial technical report/document.  
 PSO 4: Able to successfully prepare for the competitive examinations like CSIR-NET, GATE and State Level eligibility test for Lectureship  
 PSO 5: Develop strong analytical skills and strong background in the Chemical sciences to join

#### **Semester-1**

##### **Subject and code: PH 541.1 : INORGANIC CHEMISTRY**

##### **Course Outcomes:**

CO 1: Describe the types of bonds and molecular shape of compounds with emphasis on VSEPR, VB and MO theory of complexes.  
 CO 2: Explain the chemistry of acids, bases, non-aqueous solvents and the concepts of hard and soft acids and bases  
 CO 3: Discuss the properties of the non-transition elements like C, B and Si and their frameworks  
 CO 4: Illustrate the properties of Nitrogen, Phosphorus, Sulphur and noble gas compounds.

##### **Subject and code: PH 542.1 : ORGANIC CHEMISTRY**

##### **Course Outcomes:**

CO 1: Explain the basic concepts of organic chemistry  
 CO 2: Explain the reaction intermediates and mechanisms.  
 CO 3: Demonstrate the importance of conformation and stereochemistry in understanding the

##### **Subject and code: PH 543.1 : PHYSICAL CHEMISTRY**

##### **Course Outcomes:**

CO 1: Understand the basic concepts of thermodynamics and its applications.  
 CO 2: Gather the knowledge about chemical kinetics and its applications  
 CO 3: Familiarize with the various concepts in heterogeneous catalysis.  
 CO 4: Detail the study of the principle and applications of electrochemistry

##### **Subject and code: PS 544.1 : PRINCIPLES OF ANALYTICAL CHEMISTRY & SEPARATION TECHNIQUES**

##### **Course Outcomes:**

CO 1: Gain a domain knowledge about various sampling techniques and errors.  
 CO 2: Evoke the fundamental concepts in different titration techniques  
 CO 3: Understand the principle of different chromatography techniques and apply that knowledge for the separation and purification of different samples

<b>Subject and code: PS 545.1 BIOORGANIC CHEMISTRY</b>
<b>Course Outcomes:</b>
CO 1: Understand the chemical principles of living cells, their biomolecules and biocatalytic reactions. CO 2: Study the basic principles of nucleic acid chemistry. CO 3: Explain the structure determination, synthesis and classification of biomolecules like
<b>Subject and code: PS 546.1 RESEARCH METHODOLOGY</b>
<b>Course Outcomes:</b>
CO 1: Evaluate Research output with philosophical base and greater relevance to the society CO 2: Identify the parameters of Quality research with scientific methodology CO 3: Understand the concepts Original Research, ethical guidelines and practices in conducting the research and publication of papers. CO 4: Create awareness on Intellectual property Rights and Patents.
<b>Subject and code: PS 547.1P : INORGANIC CHEMISTRY PRACTICALS – I</b>
<b>Course Outcomes:</b>
CO 1: Estimate the quantity and quality of different compounds and metal ions using gravimetry, volumetry and complexometric techniques.
<b>Subject and code: PS 548.1P : ORGANIC CHEMISTRY PRACTICALS – I</b>
<b>Course Outcomes:</b>
CO 1: Carry out multi-step organic synthesis
<b>Subject and code: PS 549.1P : PHYSICAL CHEMISTRY PRACTICALS – I</b>
<b>Course Outcomes:</b>
CO 1: Carry out experiments related to viscometry, Polarimetry, Refractometry, Conductometry, Potentiometry and pH metry. CO 2: Determine the $K_a$ of various acids by different electroanalytical techniques.
<b>Semester-2</b>
<b>Subject and code: PH 541.2: ADVANCED INORGANIC CHEMISTRY</b>
<b>Course Outcomes:</b>
CO 1: Understand the Chemistry of d block elements, Lanthanides and Actinides and explain the magnetic and electronic properties of them CO 2: Describe the VB and MO theory of complexes and electronic and bonding reactivities of transition metals CO 3: Describe the basic concepts of organometallic chemistry and their bonding patterns especially with unsaturated ligands CO 4: Explain the spectral and magnetic properties of metal complexes
<b>Subject and code: PH 542.2: ADVANCED ORGANIC CHEMISTRY</b>
<b>Course Outcomes:</b>
CO 1: Describe the mechanisms of different types organic reactions. CO 2: Understand the chemistry of radical reactions and its applications. CO 3: Understand the mechanism of additions to various Carbon based multiple bonds CO 4: Achieve skills in constructing homo/heterocyclic rings of significant molecules
<b>Subject and code: PH 543.2: ADVANCED PHYSICAL CHEMISTRY</b>
<b>Course Outcomes:</b>

CO 1: Gather the knowledge in the Quantum Chemistry and its application CO 2: Explain the approximation methods in quantum mechanics CO 3: Describe the quantum mechanical explanation of chemical bonding CO 4: Explain the relationship between microscopic properties of molecules with macroscopic
<b>Subject and code: PS 544.2: MOLECULAR SYMMETRY AND MOLECULAR SPECTROSCOPY</b>
<b>Course Outcomes:</b>
CO 1: Apply the principles of group theory in chemical bonding. CO 2: Define aspects of specific spectroscopic techniques, applications of molecular symmetry in Microwave and Vibrational spectroscopy CO 3: Define aspects of specific spectroscopic techniques, applications of molecular symmetry in Rotational and Raman spectroscopy
<b>Subject and code: PS 545.2 : CHEMISTRY OF BIOMOLECULES</b>
<b>Course Outcomes:</b>
CO 1: Explain the structure and role of biomolecules like peptide, proteins and lipids CO 2: Understand the chemical principles of living cells, their biomolecules and biocatalytic reactions. CO 3: Detail the synthesis and stereochemistry of carbohydrate
<b>Subject and code: PS 546.2P : INORGANIC CHEMISTRY PRACTICALS – II</b>
<b>Course Outcomes:</b>
CO 1: Estimate binary mixtures of metallic ions in solution CO 2: Analyse the presence of inorganic salts qualitatively
<b>Subject and code: PS 547.2P : ORGANIC CHEMISTRY PRACTICALS – II</b>
<b>Course Outcomes:</b>
CO 1: Separate and analyse the binary mixture of Organic Compounds
<b>Subject and code: PS 548.2P : PHYSICAL CHEMISTRY PRACTICALS – II</b>
<b>Course Outcomes:</b>
CO 1: Determine cryoscopic constants, dissociation constants and various other physical properties of compounds CO 2: Carry out kinetic experiments to determine the order, rate of various chemical reactions.
<b>Subject and code: PO 549.2- ANALYTICAL TECHNIQUES</b>
<b>Course Outcomes:</b>
CO 1: Gain a domain knowledge about biomolecules and the chemistry related to it CO 2: Understand different electro-analytical techniques CO 3: Understand the chemistry of Polymers
<b>Semester-III</b>
<b>Subject and code:</b> <b>PH 541.3 :ORGANOMETALLIC, BIOINORGANIC AND COORDINATION CHEMISTRY</b>
<b>Course Outcomes:</b>
CO 1: Describe the basic concepts, synthesis, reaction chemistry of organometallic compounds and the structure and bonding patterns. CO 2: Detail the mechanism of different organometallic reactions and catalysis and their application as industrial catalysts.

CO 3: Understand the role and interaction of Metal ions in biological systems.  
 CO 4 : Understand the nomenclature, metal-ligand reactions and their mechanism and identify

**Subject and code: PH 542.3: ELECTROANALYTICAL RADIOCHEMICAL AND THERMOANALYTICAL TECHNIQUES**

**Course Outcomes:**

CO 1: Describe the principles of electrochemistry and applications of electromotive force.  
 CO 2: Explain the principles of irreversible thermodynamics and bioenergetics  
 CO 3: Demonstrate a systematic understanding of the key aspects of nuclear chemistry and their analytical applications.  
 CO 4 : Understand and apply various electro-analytical techniques in qualitative and quantitative analysis.

**Subject and code: PS 543.3: MOLECULAR SPECTROSCOPY**

**Course Outcomes:**

CO 1: Gather knowledge about various spectroscopic techniques such as IR, NMR, UV and Mass spectroscopy analysis.  
 CO 2: Understand theory and application to mass spectrometry, ultraviolet and visible spectroscopy, infrared spectroscopy, nuclear magnetic resonance spectroscopy.  
 CO 3: Apply NMR, IR, MS, UV-Vis spectroscopic techniques in solving structure of organic molecules

**Subject and code: PS 544.3 : MEDICINAL CHEMISTRY**

**Course Outcomes:**

CO 1: Explain the mechanism of drug action and drug designing.  
 CO 2: Understand the classification, structure and mechanism of action of drugs.  
 CO 3: Develop an understanding on various CNS depressants

**Subject and code: PS 546.3P: COMPUTERS FOR CHEMISTS**

**Course Outcomes:**

CO 1: Understand about the different operating systems and softwares  
 CO 2: Get training on using subject specific softwares  
 CO 3: Get a hands-on experience to use the relevant softwares

**Subject and code:**

**PS 545.3P: ANALYTICAL CHEMISTRY PRACTICALS – I**

**Course Outcomes:**

CO 1: Analyze the common and rare cations in a mixture by different titration techniques.  
 CO 2: Handle spectrophotometry for various determinations

**Subject and code: PS 546.3P ANALYTICAL CHEMISTRY PRACTICALS – II**

**Course Outcomes:**

CO 1: Have clear understanding of different analytical instruments.  
 CO 2: Apply chromatographic techniques as analytical tool in chemistry.

**Subject and code: PO547.3 OPTICAL METHODS OF ANALYSIS**

**Course Outcomes:**

CO 1: Understand the basic principles, working and application of atomic absorption spectroscopy  
 CO 2: Will be able to describe the physical principles of photochemistry and explain the methods of fluorescence spectroscopy.

CO 3: To learn and analyze the optical properties of solids using various instrumentation techniques.

#### Semester-IV

**Subject and code:**

**PH 541.4: ORGANIC SYNTHETIC METHODS**

**Course Outcomes:**

CO 1: Understand and apply the various reagents in organic synthesis and design organic synthetic reactions.

CO 2: Describe the applications of oxidation and reduction techniques in organic syntheses.

CO 3: Prefer suitable reagent for important reactions/building appropriate bonds.

CO 4 : Understand the principles and applications of protecting groups in chemistry

**Subject and code: PH 542.4: SPECTROSCOPIC METHODS OF ANALYSIS**

**Course Outcomes:**

CO 1: Learn the fundamental principles of instrumental measurements,

CO 2: Develop and understand the basic principles and application of Electron spin resonance

(ESR) spectroscopy, Photoelectron, NQR and Mossbauer spectroscopy for the structural elucidation of compounds.

CO 3: Understand the underlying principle of different biophysical methods and will be able to describe the physical principles of photochemistry

**Subject and code: PH 543.4: CHEMISTRY OF POLYMERS AND NATURAL PRODUCTS**

**Course Outcomes:**

CO 1: Understand preparation methods, property uses of some industrially important polymers.

CO 2: Describe the morphology, structure thermal, physical, and mechanical properties of polymers.

CO 3: Gather knowledge about the classification, isolation techniques, understand the various synthetic approaches in Natural Products synthesis structural elucidation of natural products.

CO 4: Explain the basics and applications of concerted reactions and pericyclic reactions. Develop an in-depth knowledge of the basics and applications with mechanistic understanding in concerted reactions apply those in the synthesis of organic compounds.

**Subject and code: PH 544.4P ANALYTICAL CHEMISTRY PRACTICALS – IV**

**Course Outcomes:**

CO 1: Understand of different analytical instruments.

CO 2: Experimental verification of fundamental concept

CO 3: Application of spectroscopic techniques as analytical tool in chemistry

**Subject and code: PH 546.4: APPLIED ANALYSIS AND AUTOMATION**

**Course Outcomes:**

CO 1: To be able to determine the reaction rates

CO 2: Be able to describe the chemical and biochemical properties of major food constituents,

poisonous materials and have an overview of the automated systems

CO 3: An ability to ensure the quality of production processes within the field of chemistry so as to guarantee effective output.

<b>Subject and code: PS 547.4 : RADIATION AND PHOTOCHEMISTRY</b>
<b>Course Outcomes:</b>
CO 1: Demonstrate a systematic understanding of the key aspects of nuclear chemistry and their analytical applications
CO 2: Acquire the knowledge of nucleus, nuclear reaction, radioactive techniques and application of radioisotopes.
CO 3: Describe the methods of measurements and kinetics of photochemical reactions
CO 4: Discuss the principle of absorption and emission of radiation and explain the mechanism of Jablonski diagram

<b>Department Name:</b>	<b>P 550 M.Sc. (Corporate Psychology)</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO1 Prepare human resource professionals /Corporate psychologists with a multidisciplinary approach to address legal, ethical and multicultural issues and challenges in the corporate.</p> <p>PO2 Develop leadership skills and core competencies required to stay ahead in the corporate / industry</p> <p>PO3 Develop employability skills to manage global human resources</p> <p>PO4 Contribute to employee performance, organizational effectiveness through a scientist practitioner approach</p> <p>PO5 Build organizations by focusing on people, process, products and profits.</p> <p>PO6 Engage actively in socially responsible activities to promote health, harmony, human welfare and well- being in the society.</p> <p>PO7 Adopt and Display values of ethics and integrity in their organizational practices reflecting the core values of Jesuit education.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO 1 Demonstrate the ability to think critically and scientifically about human behaviour and apply this knowledge specifically in the work context.</p> <p>PSO 2 Competence in understanding and developing scientific and need based interventions to enhance human resource in the corporate sector.</p> <p>PSO 3 Design, develop and conduct training programs to enhance human resource in Organizations.</p> <p>PSO 4 Assess, Design and Conduct need based research in the organizational context.</p> <p>PSO 5 Examine, explain, recognize, and address multi-cultural issues in the organizations using proven theories and models.</p> <p>PSO 6 Design, Construct and standardize psychometric tools applicable to workplace setting.</p> <p>PSO 7 Explore, integrate, assess, learn and apply the skills and knowledge in real time through Internship in organizations.</p>	
<b>Subject and code: PH 551.1 PSYCHOLOGICAL PROCESSES (Hard Core)</b>	
<b>Course Outcomes:</b>	
<p>CO 1 Understand the basic psychological processes underlying behavior.</p> <p>CO 2 Knowledge of how information is organized, synthesized and integrated.</p>	

CO 3 Identify and manage emotions both at intra and interpersonal level to enhance the quality of relationship in personal and professional life

CO 4 Apply the principles of learning to modify behaviour and enhance workplace productivity.

CO 5 Recognize the subtle social forces at work like conformity, group influence, attitudinal and behavioural manifestations of social relations.

CO 6 Analyse the dynamics of human behavior and individual differences in the work context.

CO7 Application of the psychological concepts to understand real time work place issues .

**Subject and code: PH 552.1 PSYCHOLOGICAL ASSESSMENT (Hard Core)**

**Course Outcomes:**

CO 1 Understand the technical, ethical and legal foundations of psychological tests.

CO 2 Compare the different methods of assessment and learn to use them effectively for the purpose of assessment.

CO 3 Become aware of multicultural concerns related to testing, and integrate test scores into a meaningful communication in the form of a psychological report.

CO 4 Understand the basic statistical concepts which forms the basis for psychometric tool development

CO 5 Competence to develop a Psychological tool

CO 6 Critique psychometric instruments with respect to normative data provided in the technical manual

CO 7 Competence to assess workplace behavior and write reports of psychological assessment.

**Subject and code: PH 553.1 HUMAN RESOURCE MANAGEMENT (Hard Core)**

**Course Outcomes:**

CO 1 Understand the significance of Human Resource Management in growing competitive economy.

CO 2 Use the tools and techniques of Human resource management in the selection and recruitment process

CO 3 Explain the process of career development and succession planning

CO 4 Analyze the methods of performance appraisal and errors in evaluation

CO 5 Assess training needs and plan training programs

CO 6 Explain and suggest relevant compensation methods in organizations

CO 7 Apply principles of Psychology to enhance human resource in organizations

**Subject and code: CPH 554 .1P PSYCHOMETRIC TESTING - I (Hard Core)**

**Course Outcomes:**

CO1 : Describe the history and process of test construction of different psychological tests

CO2 : Assess the various psychological constructs or variables as applicable to workplace set up

: Measure the components of personality and compare it with the normative data in the organizational con

CO4 : Apply the required test in the workplace context to determine the quality of work life balance  
 CO5 : Use the tests to assess and understand the organizational climate of the workplace  
 CO6 : Determine the test to assess and measure specific aspect related to individual or workplace

**Subject and code: PH 555.1P INTERPERSONAL SKILLS TRAINING - I (Hard Core)**

**Course Outcomes:**

CO 1 Have a positive attitude towards work and relationship  
 CO 2 Articulate their thoughts verbally and in writing  
 CO 3 Develop skill sets necessary for good interpersonal communication  
 CO 4 Become reliable, responsible and empathetic leaders who will align with the organizational goals  
 CO 5 Impart life skills training effectively in the organizations and social situations  
 CO 6 Develop need-based modules for the corporate  
 CO 7 Trained to be trainers

**Subject and code: PS 556.1 ORGANIZATIONAL PSYCHOLOGY (Soft Core)**

**Course Outcomes:**

CO 1 Understand the complicated systems of individual and group psychological processes involved in the world of work  
 CO 2 Connect and apply the basic principles of Industrial / Organizational Psychology to Personnel and Human Resource management within organizations  
 CO 3 Adopt a scientist practitioner approach in organizations, design and conduct need based research.  
 Co 4 Analyze the relevance of motivation theories and suggest interventions to enhance motivation in Employees  
 CO 5 Identify the cause of counterproductive behaviour and suggest strategies to promote productive behaviour  
 CO 6 Enhance worker wellbeing by identifying and addressing maladaptive behaviours at the workplace.

**Semester-II**

**Subject and code: PH 551.2 TRAINING AND DEVELOPMENT (Hard Core)**

**Course Outcomes:**

CO 1 Describe the importance and need of training and development in the organization and challenges associated with implementation of training programmes  
 CO 2 Assess the training needs in the organization at different levels and explaining the process of training needs assessment  
 CO 3 Learn the process of training design and analyse the effectiveness of various methods to deliver the training programme  
 CO 4 Analyze the various methods of training evaluation and determine the cost and benefits of training to the organization  
 CO 5 Knowledge of strategic training programme and assessing the requirement of different strategic training methods and management development programmes

CO 6 Explain different models of training department and understand its implications in the future of training in the organization

CO 7 Compare the benefits and limitations of inbuilt training program and outsourcing of training in the Organization

CO 8 Design need-based training Programs

**Subject and code: PH 552.2 CORPORATE CULTURE AND DIVERSITY (Hard Core)**

**Course Outcomes:**

CO 1 Understand the importance of culture in organizations

CO 2 Connect the concept of culture with corporate firms and cross-cultural aspects

CO 3 Identify and evaluate the underlying psychological processes involved in organizations in the changing cultural context

CO 4 Analyze the mechanism of communication in cross cultural corporate setup and the impact of corporate culture upon organizational communication

CO 5 Compare the global teams in connection with ethics in international context

CO 6 Evaluate the concept of foreign assignments and challenges.

CO 7 Learn strategies to manage cultural diversity in organizations

**Subject and code: PS 553.2 STATISTICS AND RESEARCH METHODOLOGY**

**Course Outcomes:**

CO 1 Competent knowledge base in scientific thinking and Scientific method as a model for research

CO 2 Strong theoretical foundations in quantitative and qualitative research methods.

CO 3 Understand, describe and use the various traditions of research methodologies in organizational psychology and engage in context based multidisciplinary research.

CO 4 Competent in writing research proposal, design and conduct research

CO 5 Analyses of data using advanced software and statistical tools.

CO 6 Critically analyze the findings, Report the findings, and implement them.

**Subject and code: PS 554.2 ORGANISATIONAL BEHAVIOUR (Soft Core)**

**Course Outcomes:**

CO 1 Manage and develop human resources at work.

CO 2 Understand work place behavior through micro and macro perspectives in organizations.

CO 3 Discuss strategies to manage the workforce to achieve greater results.

CO 4 Assess the impact of power and politics on employee's behaviour at the workplace

CO 5 Describe the various types of organizational structure and identify the limitations and strengths of different organizational structures

CO 6 Develop the ability and skill to identify and modify conflict causing situations at the workplace and strategies of negotiation.

**Subject and code: PS 555.2 MANAGERIAL ECONOMICS (Soft Core)**

**Course Outcomes:**

CO 1 Understand Fundamentals of Economics and its relation to complex business realities

CO 2 Associate the current economic phenomena with existing theory and contemporary economic issues.

CO 3 Explain the cost of choices and trade-offs and demonstrate how changes in the determinants of supply and demand affect the equilibrium price and quantity of a good or service.

CO 4 Enumerate short run and long run costs, associate economies and dis economies of scale to returns to scale.

Co 5 Calculate and graphically illustrate the firms fixed, variable, average marginal and total cost, and determining the profit maximizing output level.

CO 6 Apply the principle of macroeconomics in explaining the behavior of macro-economic variables at national as well as global level.

**Subject and code:PS 556.2P PSYCHOMETRIC TESTING II (SOFT Core)**

**Course Outcomes:**

CO 1 Describe the history and process of test construction of different psychological tests

CO 2 Familiarize with the various psychological constructs applicable to workplace set up

CO 3 Apply test in the workplace context to determine motivation, leadership, strategic talent management, human resource development and job involvement.

CO 4 Prepared to handle HR issues through simulation exercises in collective bargaining, in -basket Exercises, leaderless group discussion.

CO 5 Administer psychological tests, analyze and write test reports.

CO 6 Use psychometric tools to assess employees at different levels based on the need of the organizations

**Subject and code: PS 557.2P INTERPERSONAL SKILLS TRAINING LAB II (SOFT Core)**

**Course Outcomes:**

CO 1 Have a positive attitude towards work and relationship

CO 2 Articulate their thoughts verbally and in writing

CO 3 Develop skill sets like assertiveness, conflict resolution, team building necessary for good interpersonal communication

CO 4 Become reliable, responsible and empathetic leaders who will align with the organizational goals

CO 5 Impart life skills training effectively in the organizations and social situations

CO 6 Develop need-based modules for the corporate

CO 7 Trained to be trainers

**Subject and code: PO 558.2 BEHAVIOUR AND SOCIETY (Elective)**

**Course Outcomes:**

CO 1 Understand how people think, feel and act in the social context

CO 2 Describe how individuals think about, influence and relate to one another

CO 3 Analyse the outcome of social interactions on impression formation, attitude, prejudice, romantic attraction, friendship and aggression

CO 4 Discuss and analyze the reasons for social conflicts and steps to alleviate conflicts

CO 5 Assess the reasons for prosocial behaviour and strategies to enhance helping behaviour

CO 6 Apply the principles of social psychology to challenge prejudice, discrimination, stereotype attitudes and promote peace

**Semester-III**

**Subject and code: PH 551.3 CORPORATE LEADERSHIP (Hard Core)**

<b>Course Outcomes:</b>
CO 1 Understand leadership and various leadership processes CO 2 Learn various leadership models and their efficiency CO 3 Compare different leadership styles, theories, and business leaders CO 4 Analyze changing role of a leader and the relationships between leader –followers and leader - situation CO 5 Evaluate ethical leadership and its impact on society CO 6 Challenge Gender stereotypes and accept the role and contributions of women corporate leaders
<b>Subject and code:</b>
<b>PH 552.3 ORGANIZATIONAL CHANGE AND DEVELOPMENT (Hard Core)</b>
<b>Course Outcomes:</b>
CO1 Synthesize theories and models of organisational behaviour, organisational change and development and their critiques CO 2 Identify and describe the historical and contemporary transformations impacting the workplace and how those factors impact organizations and their work  CO3 Apply principles of systems thinking and relevant theories that are foundational to organizational change, current research concerning individuals, groups, and organizations to the process of change CO 4 Recognize common symptoms and reactions to change in the workplace and recommended interventions to address the reactions/resistance CO 5 Critique the range of change interventions in relation to their appropriateness to a range of research and evaluate critically the impact organisational change interventions at all levels of an organisation CO 6 Evaluate and assess an organizational change program & Develop an awareness of influencing and facilitating change CO 7 Design and plan the implementation of multiple OD interventions & enact human relations principles in the change process CO 8 Understanding the impact of technological interventions and the way it facilitates change
<b>Subject and code: PS 553.3 CORPORATE REPORTING AND ACCOUNTABILITY (Soft Core)</b>
<b>Course Outcomes:</b>
CO 1 Understand the basics of accounting with practical experience. CO 2 Assess various financial statements and its applicability in corporate sector. CO 3 Analyze various Managerial accounting tools with practical knowledge. CO 4 Understand financial reporting and its relevance in corporate accountability. CO 5 Examine the various psychological factors influencing accounting scams with case analysis. CO 6 Assess corporate accountability with relevant financial and managerial accounting tools.
<b>Subject and code: PS 554.3 CORPORATE ETHICS AND GOVERNANCE (Soft Core)</b>
<b>Course Outcomes:</b>
CO 1 Understand the basics of ethics, ethical dilemma and concepts of corporate Governance. CO 2 Discuss the role of ethics in different departments in corporate setup.

CO 3 Evaluate and develop CSR models and practice in professional lives.  
 CO 4 Discuss, analyze and apply the various models of governance  
 CO 5 Analyze corporate governance practice in India and internationally.  
 CO 6 Demonstrate the ability to apply the core principles of governance like accountability, responsibility and transparency.

**Subject and code: PS 555.3 INDUSTRIAL RELATIONS AND LABOUR LAWS**

**Course Outcomes:**

CO 1 Understand the evolution and development of Industrial Relations and the history of enactments of Labour laws in India.  
 CO 2 Describe the different roles of stake holders in Industrial Relations in India.  
 CO 3 Explain the causes of industrial conflicts and the role of various stake holders in resolving industrial Conflicts  
 CO 4 Aware of the statutory provisions for working conditions, health, and safety of workforce in India and provisions relating to the Trade unions, retrenchment, lay-offs, and lockouts  
 CO 5 Prepare payroll and monitor social security measures.

**Subject and code: PS 556.3 MARKET BEHAVIOUR AND ANALYSIS (soft core)**

**Course Outcomes:**

CO 1 Understand the behavior of consumers within the marketing system in a society  
 CO 2 Analyze the underlying psychosocial processes involved in consumer behavior  
 CO 3 Explain the different consumer decision making models, its uses and limitations.  
 CO 4 Aware of ethical considerations while influencing the buyers' decisions to acquire things  
 .CO 5 Understand and analyse brand personality image through personality theories  
 CO 6 Apply the understanding of consumer decision making process to enhance sales

**Subject and code:**

**PS 557.3P CORPORATE COUNSELLING (Soft Core)**

**Course Outcomes:**

CO 1 Understand the need for Employee counselling and learn the working of employee Assistance Programs in organizations and its limitations  
 CO 2 Develop core conditions and skills in counselling (both basic and advanced) by Practicing hypothetical case scenarios.  
 CO 3 Compare and use different counselling models to suit the issues and the needs of the client  
 CO 4 Use Transactional analysis and Rational emotive cognitive behaviour therapeutic techniques  
 CO 5 Conduct counselling sessions independently, identify addictive behaviors and initiate the process of referrals for admission to hospitals and rehabilitation centers.  
 CO 6 Conduct psycho education sessions to maintain psychological and social well-being of employees  
 CO 7 Follow the ethical code of conduct of APA while conducting counselling sessions.

**Subject and code:**

**PS 558.3P CORPORATE SELECTION AND DEVELOPMENT (Soft Core)**

**Course Outcomes:**

CO 1 Understand the role of HR department/HR professional in the organization  
 CO 2 Learn the HR cycle from Recruitment to exit interview

CO 3 Compare the best HR practices and strategies applicable to different industries CO 4 Trained to recruit, retain and manage talent, as an entry level HR professional. CO 5 Apply the knowledge gained in the entire course to practical use. (HRM, Labour Laws, Organization Behaviour , Training and Development,
<b>Subject and code: PO 559.3 Basic Counseling Skills ( Open Elective)</b>
<b>Course Outcomes:</b>
CO 1 Describe the difference between counselling and other forms of communication CO 2 Compare the application of different Psychological theories in counselling CO 3 Practice and adopt the skills required for better communication CO 4 Describe the stages involved in the process of counselling CO 5 Challenge and embrace universal human values for better interpersonal relations. CO 6 Incorporate Counselling skills in everyday interaction.
<b>Semester-IV</b>
<b>Subject and code: DISSERTATION</b>
<b>Course Outcomes:</b>
CO 1 Apply knowledge of psychological research in the field of human resource management CO 2 Develop research skills in organizational research ·CO 3 Competent to identify research problems in the field of corporate psychology CO 4 Conduct need based organizational research (Evidence based research) ·CO 5 Suggest research-based interventions to real time organizational issues.
<b>Subject and code: INTERNSHIP</b>
<b>Course Outcomes:</b>
CO 1 Practical training enables the trainees to achieve high level of competency and skill to work in organizations CO 2 Develop an appreciation for the linkage between organization and its macro environment CO 3 On the job training exposure in HR practices in different types of organizations so as to reduce the gap between theory and practice ·CO 4 Apply, evaluate and debate theory and practice of psychological principles and Human resource Management in organizations. CO 5 Job Ready and opportunity for employment.

<b>Department Name:</b>	<b>P 560 M.Sc. (Mathematics)</b>
<b>PROGRAMME OUTCOMES</b>	
PO1	Understand the fundamental axioms in Mathematics and develop problem solving skills.
PO2	Develop analytical thinking and logical reasoning.
PO3	Pursue careers in academia, industry and the other areas of Mathematics.
PO4	Apply knowledge of Mathematics in all fields of learning including higher research and its extensions.
PO5	Crack lectureship and fellowship exams approved by UGC like CSIR-NET, KSET, GATE etc.

<b>PROGRAMME SPECIFIC OUTCOMES</b>	
On completion of 2 years M.Sc Mathematics programme, student will be able to	
PSO1	Understand formal mathematical definitions, concepts and apply them to prove statements in Analysis
PSO2	Develop problem solving skills using Matrix Theory in Linear Algebra and will be able to apply in other fields.
PSO3	Understand the concepts of groups, rings, fields and other algebraic structures.
PSO4	Understand the importance and applications of Operations Research to find solutions to real life problems.
PSO5	Understand various properties of topological spaces and be able to prove Lindelof's theorem, Urysohn's Lemma, Tietze Extension theorem, etc.
PSO6	Understand the concept of Graphs and its wide range of applications in physical, biological, social and information systems
PSO7	Learn techniques of Complex Analysis, describe domains and compute limits in the complex plane, use the Cauchy-Riemann equations to obtain the derivative of complex functions, evaluate integrals using Residue theorem.
PSO8	Apply the fundamental concepts of Numerical Analysis, Ordinary Differential Equations and Partial Differential Equations
PSO9	Understand the fundamental applications of Functional Analysis and the concepts associated with the dual of a linear space.
PSO10	To solve problems using FOSS and prepare documents using Latex software which will be very useful for their research programs
<b>Subject and code: PH 561.1 Algebra I</b>	
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>Identify the concept of Normal groups and Quotients groups.</li> <li>Investigate symmetry using group theory.</li> <li>Analyze Permutation groups and counting principle.</li> <li>Perform computations in symmetric groups</li> <li>Explain Sylow theorem and its applications.</li> <li>Provide information on ideals and Quotient rings, Field of Quotient of an integral domain</li> </ul>	
<b>Subject and code: PH 562.1 Linear Algebra I</b>	
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>A student will be able to</li> <li>gain knowledge of theory of matrices, and their operations</li> <li>solve linear system of equations</li> <li>learn the concepts of subspace, basis, linear independence, dimension of vector spaces and linear transformations</li> <li>understand the concept of Eigen values, eigen vectors understand the concept of diagonalization of matrices solve system of differential equations using matrix theory and compute matrix exponentials</li> </ul>	
<b>Subject and code: PH 563.1 Real Analysis I</b>	
<b>Course Outcomes:</b>	

<ul style="list-style-type: none"> <li>• Understand basic properties of <math>\mathbb{R}</math>, such as its characterization as a complete ordered field, Archimedean Property, density of <math>\mathbb{Q}</math>, countability and uncountability of sets.</li> <li>• Classify and explain open and closed sets, limit points, compactness, connectedness etc. in a metric space.</li> <li>• Use the definitions of convergence as they apply to sequences and series.</li> <li>• Determine the continuity of functions in metric spaces</li> <li>• Find the derivative of functions defined on subsets of the real line.</li> <li>• Understand the differentiation of vector valued functions</li> </ul>
<b>Subject and code: PS 564.1 Graph Theory</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• After completing this course, the student will be able to:</li> <li>• Write precise and accurate mathematical definitions of basics concepts in graph theory.</li> <li>• Study the properties of trees and connectivity.</li> <li>• Apply results to identify both Eulerian graphs and Hamiltonian graphs.</li> <li>• Understand the concepts Planarity including Euler identity.</li> <li>• Discuss and understand the importance of Coloring.</li> <li>• Understand and apply various proof techniques in proving theorems in graph theory.</li> </ul>
<b>Subject and code: PS 565.1 Fluid Mechanics</b>
<b>Course Outcomes:</b>
<p>After completing this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• the types of fluid flows, and understand the basic laws</li> <li>• the principles and phenomena in the area of fluid mechanics</li> <li>• derive Euler's equation of Motion and deduce Bernoulli's equations</li> <li>• to solve problems related to kinematics and dynamics of fluids, losses in a flow system, flow</li> <li>• through pipes and flow past immersed bodies</li> </ul>
<b>Subject and code: PS 566.1 OPERATIONS RESEARCH</b>
<b>Course Outcomes:</b>
<p>On completion of this course students should be able to:</p> <ul style="list-style-type: none"> <li>• Define and formulate linear programming problems and appreciate their limitations.</li> <li>• Solve linear programming problems using appropriate techniques and interpret the results obtained.</li> <li>• Explain the primal-dual relationship.</li> <li>• Develop mathematical skills to analyse and solve transportation and assignment models</li> <li>• arising from a wide range of applications.</li> <li>• Understand the concept of game theory and learn its applications in different social situations.</li> </ul>
<b>Subject and code: PS 567.1 Ordinary Differential Equations</b>
<b>Course Outcomes:</b>

<ul style="list-style-type: none"> <li>• Use the Wronskian to determine if a set of functions is linearly independent, construct a second solution to a second order differential equation by reduction of order</li> <li>• Find the complete solution of a homogeneous differential equation with constant coefficients by examining the characteristic equation and its roots.</li> <li>• Find the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients and by the method of variation of parameters.</li> <li>• Solve basic application problems described by second order linear differential equations with constant coefficients.</li> <li>• Identify ordinary and singular points and find power series solutions about ordinary points and singular points.</li> </ul>
<b>Semester-II</b>
<b>Subject and code: PH 561.2 Algebra II</b>
<b>Course Outcomes:</b>
<p>On completion of this course student should be able to:</p> <ul style="list-style-type: none"> <li>• Understand the notion of irreducibility, primes and unique factorization Derive and apply Gauss Lemma, Eisenstein criterion for irreducibility of polynomials.</li> <li>• Understand the concept of Factorization and ideal theory in the polynomial ring, the structure of Primitive polynomial</li> <li>• Explain the concepts of Field extensions and characterization of finite normal extensions as splitting field.</li> <li>• Understand the structure and construction of finite fields</li> <li>• Analyze splitting fields, Galois extensions and Galois groups</li> </ul>
<b>Subject and code: PH 562.2 Real Analysis II</b>
<b>Course Outcomes:</b>
<p>Upon completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the definition of integrals and their properties</li> <li>• Determine the Riemann-Stieltjes integrability of a bounded function and prove a selection of theorems concerning integration</li> <li>• Recognize the difference between pointwise and uniform convergence of sequences and series of functions.</li> <li>• Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability and integrability.</li> <li>• Evaluate improper integrals</li> <li>• To gain knowledge on functions of several variables -The contraction principle, inverse function theorem and implicit function theorem.</li> </ul>
<b>Subject and code: PS 563.2 Research Methodology and Ethics</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Outcome of the Paper:</li> <li>• Quality research with scientific methodology</li> <li>• Production of good Research Reports</li> </ul>

<ul style="list-style-type: none"> <li>• Original Research following ethical guidelines and practices in</li> <li>• conducting the research and publication of papers.</li> <li>• More awareness on Intellectual property Rights and Patents.</li> </ul>
<b>Subject and code: PS 564.2 Linear Algebra II</b>
<b>Course Outcomes:</b>
<p>Course outcomes:</p> <ul style="list-style-type: none"> <li>• Student will be able to</li> <li>• Understand the concept of bilinear forms on vector spaces</li> <li>• Derive spectral theorems for various types of operators on vector spaces</li> <li>• Explain the theory of modules</li> <li>• Apply the theory in diagonalization of matrices over rings</li> </ul>
<b>Subject and code: PS 565.2 Lattice</b>
<b>Course Outcomes:</b>
<p>On completion of the course the student should be able to:</p> <ul style="list-style-type: none"> <li>• understand the concept of Partially ordered sets and Their Properties.</li> <li>• identify Lattices as posets and as Algebraic Structures and explain the theory of lattices in general.</li> <li>• explain the concept of Complete Lattices and understand their properties.</li> <li>• explain the concept of Modular and Distributive Lattices.</li> </ul>
<b>Subject and code: PS 566.2P Computational Lab -1</b>
<b>Course Outcomes:</b>
<p>Course outcomes:</p> <ul style="list-style-type: none"> <li>• Upon completion of the course student will be able to:</li> <li>• understand the usefulness of FOSS in Mathematical computations</li> <li>• solve problems in matrix theory using FOSS</li> <li>• do computations with algebraic structures such as groups, rings and fields with the aid of FOSS</li> <li>• test the continuity, differentiability of functions and evaluate limits</li> </ul>
<b>Subject and code: PO 567.2 Basic Tools in Mathematics (OE)</b>
<b>Course Outcomes:</b>
<p>Upon completion of the course student will be able to:</p> <ul style="list-style-type: none"> <li>• know about the number system, countability and uncountability of sets</li> <li>• use the definitions of convergence as they apply to sequences and series</li> <li>• determine the limits, continuity and differentiability of functions defined on subsets of the real line.</li> <li>• Know about optimization of functions of one variable</li> <li>• solve system of linear equations using Matrix theory</li> <li>• compute eigen values and eigen vectors</li> </ul>
<b>Semester-III</b>
<b>Subject and code: PH 561.3 Complex Analysis I</b>
<b>Course Outcomes:</b>
<p>Upon completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Represent complex numbers algebraically and geometrically</li> <li>• Define and analyze limits and continuity for complex functions.</li> </ul>

<ul style="list-style-type: none"> <li>• Apply the concept and consequences of analyticity and the Cauchy-Riemann equations</li> <li>• Apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula</li> <li>• To classify singularities and poles</li> </ul>
<b>Subject and code: PH 562.3 Topology</b>
<b>Course Outcomes:</b>
<p>Upon completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Define a topology , a basis for a topology and various types of topologies</li> <li>• To construct topological spaces from metric spaces.</li> <li>• Gains knowledge on general properties of neighborhoods, open sets, closed sets, <ul style="list-style-type: none"> <li>◦ basis and sub-basis.</li> </ul> </li> <li>• Apply the properties of open sets, closed sets, interior points, accumulation points and derived sets in deriving the proofs of various theorems.</li> <li>• Understand the concepts and properties of compact and connected topological spaces.</li> <li>• Gain knowledge on the concepts of countable spaces and separable spaces.</li> </ul>
<b>Subject and code: PH 563.3 Numerical Analysis with Computational Lab</b>
<b>Course Outcomes:</b>
<p>On completion of this course the student should be able to:</p> <ul style="list-style-type: none"> <li>• Apply appropriate algorithms to solve selected problems, both manually and by writing computer programs.</li> <li>• Compare different algorithms with respect to accuracy and efficiency of solution.</li> <li>• Analyze the errors obtained in the numerical solution of problems.</li> <li>• Demonstrate the use of interpolation methods to find intermediate values in given graphical and/or tabulated data.</li> <li>• Using appropriate numerical methods, determine approximate solutions for problems of differentiation and integration</li> <li>• Using appropriate numerical methods, determine approximate solutions to ordinary differential equations.</li> </ul>
<b>Subject and code: PS 564.3 Commutative Algebra</b>
<b>Course Outcomes:</b>
<p>The student will learn</p> <ul style="list-style-type: none"> <li>• basic definitions concerning elements in rings, classes of rings, and ideals in commutative rings.</li> <li>• constructions of rings of fractions and modules of fractions, localization at prime ideals</li> <li>• the concept of Noetherian rings and Hilbert basis theorem.</li> <li>• the primary decomposition of ideals in Noetherian rings.</li> </ul>
<b>Subject and code: PS 565.3 Multivariate Calculus and Geometry</b>
<b>Course Outcomes:</b>
<p>On completion the student should be able to:</p> <ul style="list-style-type: none"> <li>• account for important theorems and concepts in multivariate analysis.</li> <li>• account for the most common multivariate methods.</li> </ul>

<ul style="list-style-type: none"> <li>• explain the geometry of curves on <math>\mathbb{R}^3</math>.</li> <li>• explain the geometry of surfaces on <math>\mathbb{R}^3</math>.</li> </ul>
<b>Subject and code: PS 566.3 Probability Theory</b>
<b>Course Outcomes:</b>
<p>Course outcomes:</p> <p>A student will be able to</p> <ul style="list-style-type: none"> <li>• Develop problem-solving techniques needed to accurately calculate probabilities</li> <li>• Apply problem-solving techniques to solving real-world events.</li> <li>• Understand the properties of discrete and continuous random variables with their joint, marginal, and conditional distributions</li> <li>• Apply selected probability distributions to solve problems.</li> </ul>
<b>Subject and code: PO 567.3 Differential Equations and Applications (OE)</b>
<b>Course Outcomes:</b>
<p>Upon completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Find solution of first order and second order ordinary differential equations using different methods.</li> <li>• Apply different techniques to solve differential equations in Applied Mathematics.</li> <li>• Find solution of first order and second order partial differential equations using different methods.</li> <li>• Find solution of wave equation and Heat equation.</li> </ul>
<b>Semester-IV</b>
<b>Subject and code: PH 561.4 Measure Theory and Integration</b>
<b>Course Outcomes:</b>
<p>On completion the student should be able to:</p> <ul style="list-style-type: none"> <li>• give a more rigorous introduction to the theory of measure.</li> <li>• Understand the notions of measurable sets and functions</li> <li>• develop the ideas of Lebesgue integration and its properties.</li> <li>• identify measurable functions.</li> <li>• construct the Lebesgue integral and understand properties of the Lebesgue integral.</li> <li>• Learn inequalities in <math>L^p</math> Spaces, signed measures and their derivatives</li> </ul>
<b>Subject and code: PH 562.4 Complex Analysis II</b>
<b>Course Outcomes:</b>
<p>Upon completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• To understand and apply results on analytic, harmonic and entire functions.</li> <li>• Gain knowledge on simply connected and multiply connected regions</li> <li>• Represent functions as Taylor, power and Laurent series,</li> <li>• Classify singularities and poles, find residues</li> <li>• Evaluate complex integrals using the residue theorem.</li> <li>• Gain knowledge on infinite products, canonical products and Gamma function.</li> </ul>
<b>Subject and code: PH 563.4 Project Work</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Upon completion of the course student will be able to:</li> <li>• understand the usefulness of FOSS in Mathematical computations</li> </ul>

<ul style="list-style-type: none"> <li>• solve differential equations using FOSS</li> <li>• classify second order PDE's</li> <li>• Solve problems in complex analysis effectively using</li> <li>• FOSS</li> </ul>
<b>Subject and code: PS 564.4 Functional Analysis</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Upon completion of this course, the student will be able to:</li> <li>• explain the fundamental concepts of functional analysis.</li> <li>• understand the definitions of linear functional and prove theorems such as the Hahn- Banach theorem, Open Mapping theorem and Uniform Boundedness Principle.</li> <li>• define linear operators, self-adjoint, isometric and unitary operators on Hilbert spaces</li> <li>• explain the concept of the spectrum of a bounded linear operator.</li> </ul>
<b>Subject and code: PS 565.4 Partial Differential Equations</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Study surfaces and curves in three-dimension space.</li> <li>• Classify partial differential equations and transform into canonical form</li> <li>• Solve linear partial differential equations of both first and second order</li> <li>• Analyze the origin of first order partial differential equations and solving them using Charpit's method</li> <li>• apply partial derivative equation techniques to predict the behavior of certain phenomena.</li> </ul>
<b>Subject and code: PS 566.4 Algebraic Number Theory</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Define and interpret the concepts of congruence, and use the theory of congruences in applications.</li> <li>• Prove and apply properties of multiplicative functions such as the Euler phi-function and of quadratic residues.</li> <li>• Apply the Law of Quadratic Reciprocity and other methods to classify numbers as</li> <li>• quadratic residues, and quadratic non-residues</li> <li>• To study the number theoretic applications of unique factorization and solving some Diophantine equations</li> <li>• Factorization of ideals in Dedekind domains</li> </ul>
<b>Subject and code: PS 567.4 Cryptography</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Upon completion of this course, the student will be able to:</li> <li>• Have knowledge on fundamentals of number theory.</li> <li>• Understand the operations with congruences, linear and non-linear congruence equations.</li> <li>• Understand basics of Cryptography and Network Security.</li> <li>• Be able to secure a message over insecure channel by various means.</li> <li>• Learn about how to maintain the Confidentiality, Integrity and Availability of data.</li> <li>• Understand various protocols for network security to protect against the threats in the networks.</li> </ul>

**Subject and code: PS 568.4 Distribution Theory****Course Outcomes:**

- Demonstrate the random variables and its functions
- Infer the expectations for random variable functions and generating functions.
- Demonstrate various discrete and continuous distributions and their usage
- Study Marginal and conditional distributions.
- The Poisson Distribution and The Gamma and Chi-square distributions to solve problems.
- Study the t & F distributions and their applications.

**Subject and code: PS 569.4P Computational Lab -2****Course Outcomes:**

- Upon completion of the course student will be able to:
- understand the usefulness of FOSS in Mathematical computations
- solve differential equations using FOSS
- classify second order PDE's
- Solve problems in complex analysis effectively using
- FOSS

**Department Name: P 570 M.Sc. (Physics)****PROGRAMME OUTCOMES**

PO 1 : Acquire a fundamental/systematic or coherent understanding of the academic field of Physics, its different learning areas and applications in basic Physics like Quantum Mechanics, Astrophysics, Materials Science, Nuclear and Particle Physics, Condensed Matter Physics, Atomic and Molecular Physics, Mathematical Physics, Analytical Dynamics, Space Sciences, and its relevance with related disciplinary areas/subjects like Chemistry, Mathematics, Life Sciences, Environmental Sciences, Atmospheric Physics, Computer Sciences, Information Technology; procedural knowledge that creates different types of professionals related to the disciplinary/subject area of Physics, including professionals engaged in research and development, teaching and government/public service; skills in areas related to one's specialization area within the disciplinary/subject area and the current and emerging developments in the field of Physics.

PO 2: Demonstrate the ability to use skills in Physics and its related areas of technology for formulating and tackling Physics-related problems, and identifying and applying appropriate physical principles and methodologies to solve a wide range of problems associated with Physics.

PO 3: Recognize the importance of mathematical modelling, simulation and computing, and the role of approximation and mathematical approaches to describe the physical world.

PO 4 : Plan and execute Physics-related experiments or investigations, analyze and interpret data/information collected using appropriate methods, including the use of appropriate software such as programming languages and purpose-written packages, and report accurately the findings of the experiment/investigations while relating the conclusions/findings to relevant theories of Physics

PO 5 : Demonstrate relevant generic skills and global competencies such as
<b>PROGRAMME SPECIFIC OUTCOMES</b>
<p>PSO 1 Fundamental understanding of the field</p> <p>PSO 2 Application of basic Physics concepts</p> <p>PSO 3 Linkages with related disciplines</p> <p>PSO 4 Procedural knowledge for professional subjects</p> <p>PSO 5 Skills in related field of specialization</p> <p>PSO 6 Ability to use in Physics problem</p> <p>PSO 7 Skills in Mathematical modelling</p> <p>PSO 8 Skills in performing analysis and interpretation of data</p> <p>PSO 9 Develop investigative Skills</p> <p>PSO 10 Skills in problem solving in Physics and related discipline</p> <p>PSO 11 Develop technical communication skills</p> <p>PSO 12 Developing analytical skills and popular communication</p> <p>PSO 13 Developing ICT skills</p> <p>PSO 14 Demonstrate professional behaviour with respect to attributes like objectivity, ethical values, self reading, etc</p>
<b>Subject and code: PH 571.1 Mathematical Physics I</b>
<b>Course Outcomes:</b>
<p>C O 1 To review the knowledge of vectors and scalar quantities.</p> <p>C O 2 To learn the concepts of vector calculus such as divergence, curl, line integrals, surface integrals, volume integrals.</p> <p>C O 3 To study fundamental theorems like The Green's theorem, Stokes' theorem and their applications in Physics.</p> <p>C O 4 To learn the concepts of curvilinear coordinates and to learn the concepts of vector calculus in curvilinear coordinates.</p> <p>C O 5 To learn the basic properties of matrices and to study the properties of special types of matrices like Hermitian, Unitary and Orthogonal matrices.</p> <p>C O 6 To study similarity and unitary transformations, concept of eigenvalues and eigenfunctions, Cayley-Hamilton's Theorem and Diagonalization of matrices.</p> <p>C O 7 To learn basic definitions of tensors and transformation laws of coordinates. Different types of tensors and algebra of tensors including quotient law.</p> <p>C O 8 To learn about first and second order partial differential equations, their classification.</p> <p>C O 9 To solve special equations like Heat equation, Laplace's equation, Poisson's equation.</p> <p>C O 10 To learn to solve a differential equation using the method of power series.</p> <p>C O 11 To learn different special functions like Legendre polynomials, Bessel's function, Laguerre polynomials and Hermite's polynomials and to study orthogonality conditions and different recurrence relations of these functions.</p>
<b>Subject and code: PH 572.1 Classical Mechanics</b>
<b>Course Outcomes:</b>
C O 1 Define and understand the basic concepts related to single particle and a system of particles

C O 2 Describe the motion of a mechanical system using Lagrange and Hamilton formalism. C O 3 Understand the principles of collisions and learn about the concept of centre of mass and laboratory coordinate system  
 C O 4 Acquire the basic knowledge of the Phase space and Phase trajectory  
 C O 5 Learn about the canonical transformation  
 C O 6 Learn about the concept of two body problem  
 C O 7 Learn the conservation theorems  
 C O 8 Acquire the knowledge about equation of the orbit and orbit's classification  
 C O 9 Learn the Kepler's laws of planetary motion  
 C O 10 Learn the general description and the concept of Scattering  
 C O 11 Learn the dynamics of the rigid body  
 C O 12 Understand the rigid body dynamics  
 C O 13 Learn the theory of small oscillation

**Subject and code: PH 573.1 Classical Electrodynamics**

**Course Outcomes:**

C O 1 To learn to apply the fundamentals of electrostatics and boundary conditions to solve various problems  
 C O 2 To learn the fundamentals of magnetostatics and magnetism  
 C O 3 To learn the electromagnetic theory through Maxwell equations and underlying theories  
 C O 4 To get a grip on gauge symmetries and transformations and also on radiation emission of a moving or oscillating charge  
 C O 5 To arrive at the plane wave equation of the electromagnetic fields and studying the plane wave solutions  
 C O 6 Analysis of reflection and transmission of waves: using electromagnetic boundary conditions.  
 C O 7 To learn the theory of waveguides and solve the problem of rectangular waveguide.  
 C O 8 To derive the Lorentz transformation equations and understanding basic relativistic dynamics. C O 9 Lorentz transformation and relativistic dynamics is learnt to be written in four vector (tensor) notation.  
 C O 10 Basic laws of electrodynamics, continuity equation, Maxwell's equations, Gauge transformations and potential theory in tensor notation.

**Subject and code: PH 574.1 Electronics**

**Course Outcomes:**

C O 1 Understand characteristics of an ideal operational amplifier (Op-amp) and a practical operational amplifier, open loop and closed loop applications of op-amp; use Op-amp for basic mathematical operations like addition, subtraction, multiplication, integration and differentiation applications and a few special applications such as filtering and comparators.  
 C O 2 Learn the use of op-amp for wave form generation applications and the applications of timer IC 555.  
 C O 3 Understand the meaning and types of power amplifiers and their applications. The student will be able to learn specialized applications of SCR, signal conditioning and other varieties of transducer circuits.  
 C O 4 Will be able to review basics of digital circuits, few aspects of registers and digital data storage, synchronous and asynchronous counter applications, memory devices and basics of a microprocessor.

Semester-II
<b>Subject and code: PH 571.2 Mathematical Physics II</b>
<b>Course Outcomes:</b>
C O 1 To review the concepts of complex numbers and functions of complex variables. C O 2 To study calculus of complex functions, Cauchy Riemann conditions and differentiability C O 3 To learn integration of complex functions, Cauchy integral theorem, concepts of poles, singularities, residues. C O 4 To study integration of complex functions using residue theorem also to get a good hold in the concept of mapping and conformal mapping. C O 5 To review the understanding in Group theory and study the concept of transformation group and symmetry groups. C O 6 To study representation of groups and understand the concepts of irreducible representations. C O 7 To learn Lie groups and their application in Physics. C O 8 To apply the Green's functions to solve various differential equations. C O 9 Reviewing and understanding the concepts of Fourier series and studying the concepts of Fourier transform and their applications in Physics and Electronics. C O 10 To study Laplace's transforms and their applications in Physics. C O 11 To learn to interpolate a function using various numerical methods. C O 12 To study the method of solving non linear equations and also differential equations using numerical methods. C O 13 To learn integration of various functions by numerical methods.
<b>Subject and code: PH 572.2 Quantum Mechanics I</b>
<b>Course Outcomes:</b>
C O 1 To setup the Schrödinger equation and to understand the physical interpretation of a quantum mechanical wave function. C O 2 To study in detail the fundamental postulates of quantum mechanics. C O 3 To understand the concepts of eigenvalues, eigenfunctions and degeneracy being applied to quantum mechanics. C O 4 To study various commutation relations and to understand its meaning C O 5 To setup the Time Independent Schrödinger equation and to learn the concept of stationary states. C O 6 To solve various problems like potential well, potential barrier and harmonic oscillator and to study the properties of stationary states of these problems. C O 7 To study the concept of angular momentum in quantum mechanics and to arrive at the eigenvalues and eigenfunctions of angular momentum and hence to understand the concept of space quantization. C O 8 To study the applications of angular momentum to spherically symmetric systems and to study parity. C O 9 To solve the problem of Hydrogen like atoms in atomic physics. C O 10 To review the concept of scattering and to study quantum mechanical scattering. C O 11 To understand Partial wave analysis in quantum mechanical scattering and also to apply Born approximation
<b>Subject and code: PH 573.2 Condensed Matter Physics- I</b>
<b>Course Outcomes:</b>
C O 1 A brief idea about crystalline materials-lattice- unit cell-miller indices-reciprocal lattice etc.

C O 2 Production and applications of X-ray. X-ray diffraction. Point groups and space groups and quasi crystals  
 C O 3 Crystal binding- types of bonds, concept of phonon vibration, phonon scattering, thermal expansion of solids and lattice thermal conductivity  
 C O 4 Free electron models of metals, quantum free electron theory, F.D Statistics, Electron in aperiodic potential, Bloch theorem, metals, semimetals and semiconductors.  
 C O 5 Semiconductors-types, Impurity atoms, electrical conductivity, quantized Hall Effect, amorphous semiconductors, organic semiconductors.

**Subject and code: PS 574.2 Research Methodology and Ethics**

**Course Outcomes:**

C O 1 To have clear understanding of the meaning and purpose of Research in academics, research philosophy and strategies of Research.  
 C O 2 To acquaint with the knowledge of methodology involved in a scientific Research  
 C O 3 To know writing of a good Research Report.  
 C O 4 To understand the ethical issues and practices in research with an awareness of rights and obligations of research participants.  
 C O 5 Understand the process of Intellectual property Rights and its different forms and implications  
 C O 6 To know how to write research papers and publish research papers.

**Subject and code: PO 577.2 Biophysics**

**Course Outcomes:**

C O 1 To study the basic concepts of radioactivity and the dose measurements using dosimetry  
 C O 2 To study the interaction of radiations like charged particles, electrons, electromagnetic radiation and the neutrons with matter and their energy loss.  
 C O 3 The detection of nuclear radiation using gas filled detector, semiconductor detectors and neutron detectors  
 C O 4 To explain the effect of radiation on DNA and DNA repair mechanisms.  
 C O 5 To explain the effect of radiation on chromosome and to study the radiation dose response of chromosomal aberrations.  
 C O 6 Biological applications of delocalization of molecules  
 C O 7 DNA and RNA structure and the effect of radiation on them  
 C O 8 Study of proteins, enzyme and carcinogenic activities

**Semester III**

**Subject and code: PH 571.3 Quantum Mechanics II**

**Course Outcomes:**

I (PH 571.1) so that it can be applied to quantum mechanical calculations.  
 C O 2 To learn the method of Dirac's ket and bra notations and to learn about general uncertainty relation and theorems like Schwartz inequality.  
 C O 3 To learn the Schrödinger, Heisenberg and interaction picture and to derive equations of motion and hence to get a broad idea of the process of quantization of a system.  
 C O 4 To solve the harmonic oscillator and angular momentum problem by matrix method.  
 C O 5 To study the concept of spin and addition of angular momenta.  
 C O 6 To study various approximation techniques in quantum mechanics like Perturbation theory, WKB approximation and variational technique.

- C O 7 To study the above techniques with real quantum mechanical examples.
- C O 8 To setup a relativistic wave equation (Klein-Gordon equation) and to understand the existence of negative probability density.
- C O 9 To setup the Dirac's equation, to study the properties of the Dirac's matrices and to arrive at the solutions of Dirac's equation and hence to give the concept of anti particles through the negative energy solutions of the Dirac's equations.
- C O 10 To introduce the concept of quantization of fields by first quantizing a classical field and then for a Schrödinger's field and relativistic fields.

**Subject and code: PO 577.2 Biophysics**

**Course Outcomes:**

- C O 1 To review the concepts of linear algebra studied in Mathematical Physics  
PH 572.3 Condensed Matter Physics- II
- C O 1 To understand various types of crystal defects and imperfections in crystal growth process.
- C O 2 To familiarise luminescence and related phenomenon.
- C O 3 To understand thermodynamics phase transitions, order-disorderness and theories of phase transitions.
- C O 4 To review magnetic properties of materials and theories of magnetism.  
Applications of magnetic properties- Magnetometer, NMR, Resonance.
- C O 5 Domain theory of magnetic materials.
- C O 6 To understand dielectric materials and their applications.

**Subject and code: PH 573.3 Thermodynamic and Statistical Physics**

**Course Outcomes:**

- C O 1 To understand the relevant quantities used to describe macroscopic systems and thermodynamic potential
- C O 2 Understand the macroscopic and microscopic description of temperature, entropy and free energy
- C O 3 Learn the theory of probability
- C O 4 Understand the concept ensembles and theory of ensembles
- C O 5 Understand macrostates and microstates
- C O 6 Learn partition functions and their importance
- C O 7 Learn the various distribution functions and their uses in classical and quantum mechanical non-interacting assemblies of systems
- C O 8 Describe the transport phenomena and understand the diffusion coefficients
- C O 9 Learn the concept of fluctuation
- C O 10 Understand the random walk problem

**Subject and code: PH 573.3 Thermodynamic and Statistical Physics**

**Course Outcomes:**

- C O 1 To understand the relevant quantities used to describe macroscopic systems and thermodynamic potential
- C O 2 Understand the macroscopic and microscopic description of temperature, entropy and free energy
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- C O 4 Understand the concept ensembles and theory of ensembles
- C O 5 Understand macrostates and microstates
- C O 6 Learn partition functions and their importance

- C O 7 Learn the various distribution functions and their uses in classical and quantum mechanical non-interacting assemblies of systems
- C O 8 Describe the transport phenomena and understand the diffusion coefficients
- C O 9 Learn the concept of fluctuation
- C O 10 Understand the random walk problem

**Subject and code: PS 573.3 Relativity and Cosmology**

**Course Outcomes:**

- C O 1 To learn the concepts of Special Theory of Relativity in Tensor notations and also to understand the concepts like Momentum transformations.
- C O 2 To study tensor analysis as a prerequisite for the General Theory of relativity and understand the meaning of a metric, geodesic and covariant differentiation.
- C O 3 To learn the theory of General Relativity starting from the Principle of Equivalence and General Covariance by deriving the Einstein's field equations.
- C O 4 To solve the Einstein's field equation for a weak metric case and arrive at Schwarzschild solutions and also to learn about the Schwarzschild radius and Black holes.
- C O 5 To study the various experimental predictions of General Relativity in detail.
- C O 6 To understand various principles underlying the study of Cosmology.
- C O 7 To study various cosmological models that explain the birth and evolution of universe.

**Subject and code: PS 574.3 Optics**

**Course Outcomes:**

- C O 1 To study the various natures of progressive plane waves with relevant solutions to the plane wave equations.
- C O 2 To learn the Fermat's principle and Helmholtz and Lagrangian equations in magnification.
- C O 3 To study the wave theory by Huygen in detail and to deduce the laws of reflection and refraction using the same.
- C O 4 To study the phenomena of Interference, Diffraction and Polarization with rigorous mathematics and physical examples.
- C O 5 To study Electro-optic effect and to learn to draw the index ellipsoid for crystals.
- C O 6 To study the phenomenon of Acousto-optic effect and to understand Raman-Nath and Bragg diffraction in crystals.

**Subject and code: PO 577.3 Experimental Techniques**

**Course Outcomes:**

- C O 1 Understand the properties of laser
- C O 2 Learn about the specific laser and their applications in day to day life
- C O 3 Learn about the theory of nonlinear optics
- C O 4 Learn about the second and third harmonic generation
- C O 5 Learn the concept of nonlinear absorption coefficients, nonlinear refractive index and nonlinear susceptibility
- C O 6 Learn the method of Z-scan technique
- C O 7 Learn the concept of vacuum and its units
- C O 8 Learn about the techniques to measure vacuum
- C O 9 Learn about the working principle of different vacuum pumps
- C O 10 Understand the working principles of TEM, SEM, XPS etc.

**Semester IV**

**Subject and code:PH 571.4 Atomic and Molecular Physics**

**Course Outcomes:**

- C O 1 To review the Bohr model and Vector model of the atom based on the experiments determining space quantization.
- C O 2 To understand the structure of the simplest atomic system, the hydrogen atom by studying its various spectra.
- C O 3 The interactions within the atomic system is studied using the perturbation theory for a detailed understanding of the fine and hyperfine atomic structure.
- C O 4 Zeeman effect, Stark effect elucidate the influence of an external magnetic and electric field on the atomic system.
- C O 5 X-ray spectra of the atoms are studied.
- C O 6 The transition processes by absorption, stimulated and spontaneous emission, when an atom interacts with an electromagnetic field are studied in detail.
- C O 7 The probability of transitions, rates, selection rules, lifetime of atomic states, spectral line widths, line shapes and broadening are understood.
- C O 8 Molecular structure is understood for a simple diatomic molecule by studying the spectra.
- C O 9 Microwave spectroscopy, infrared spectroscopy, ultraviolet-visible spectroscopy techniques of the molecular systems are studied with detailed theory, instrumentation and application.
- C O 10 Raman spectroscopy, nuclear magnetic resonance (NMR) spectroscopy, electronic spin resonance (ESR) spectroscopy, Mossbauer spectroscopy are studied with the fundamental theoretical background, instrumentation and applications to specific systems.

**Subject and code: PH 572.4 Nuclear and particle Physics****Course Outcomes:**

- C O 1 The internal properties like mass, charge and size of atomic nuclei
- C O 2 The external properties like binding energy, spin, electronic and magnetic moment.
- C O 3 To study in detail the concept of Radioactivity.
- C O 4 Detailed study on nuclear decays and their selection rules
- C O 5 To study the radiation energy loss by charged particles, electrons, electromagnetic radiation and the neutrons with matter and their energy loss.
- C O 6 The radiation detection through gas filled detector, semiconductor detectors and neutron detectors
- C O 7 To review the different properties of Nuclear forces like short range, saturation, charge independence, spin dependence.
- C O 8 To study the ground state of the deuteron problem using square well potential and as a mixture of S and D states and to learn the electric and magnetic quadrupole moments of the Deuteron bound state.
- C O 9 Yukawa's theory of nuclear forces and to explain the anomalous magnetic moment of nucleus.
- C O 10 To describe basic models like liquid drop model and shell model of the atomic nucleus.
- C O 11 Explain processes of nuclear collisions, nuclear reactions and cross section
- C O 12 To study the classification of fundamental forces and conservation laws
- C O 13 Classification of elementary particles and the properties of the particles
- C O 14 Gell-Mann-Nishijima formula and CPT theorem

C O 15 Application of symmetry arguments to particle reactions
<b>Subject and code: PS 574.4 Communication Theory</b>
<b>Course Outcomes:</b>
<p>C O 1 Transmission Lines, types and line parameters such as impedance, reflection coefficient, propagation constant. Line distortion and attenuation. Quarter and half wavelength lines. Impedance matching, quarter wave transformer, stub matching. Smith chart and its applications.</p> <p>C O 2 Wave guides and antenna: Basic concepts, TE and TM waves, types. Cavity resonators. Directional couplers. Electromagnetic radiation, elementary doublet, current and voltage distribution, resonant and non resonant antennas and their characteristics, grounded and ungrounded antennas. Effect of antenna height. Microwave antennas.</p> <p>C O 3 Microwave devices -Multicavity klystron, reflex klystron, parametric amplifiers, Gunn diode, Microwave transistors, FETs. Communication subsystems, description of the communication system transponders, spacecraft antennas, frequency reuse antennas, multiple access schemes, FDMA, TDMA, CDMA. Satellite communication</p>
<b>Subject and code: PS 575.4 Laser, Vacuum Techniques and Nonlinear Optics</b>
<b>Course Outcomes:</b>
<p>C O 1 Understand the properties of laser</p> <p>C O 2 Learn about the specific laser and their applications in day to day life</p> <p>C O 3 Learn about the theory of nonlinear optics</p> <p>C O 4 Learn about the second and third harmonic generation</p> <p>C O 5 Learn the concept of nonlinear absorption coefficients, nonlinear refractive index and nonlinear susceptibility</p> <p>C O 6 Learn the method of Z-scan technique</p> <p>C O 7 Learn the concept of vacuum and its units</p> <p>C O 8 Learn about the techniques to measure vacuum</p> <p>C O 9 Learn about the working principle of different vacuum pumps</p> <p>C O 10 Understand the working principles of TEM, SEM, XPS etc techniques</p>
<b>Subject and code: PS 576.4 Condensed Matter Physics- III</b>
<b>Course Outcomes:</b>
<p>C O 1 Different techniques of thin film preparation, thickness measurement techniques and theory of nucleation, properties and applications.</p> <p>C O 2 Superconductivity Principle, Types, Thermodynamics of superconductivity, BCS theory. Josephson effect and applications.</p> <p>C O 3 Smart materials of types, preparation and properties.</p> <p>C O 4 Nanostructural materials - synthesis, characterization, organization and application.</p>
<b>Subject and code: PS 577.4 Nuclear Structure</b>
<b>Course Outcomes:</b>
<p>C O 1 To study Deuteron problem as a mixture of S and D states and to learn the electric and magnetic quadrupole moments of the Deuteron bound state.</p> <p>C O 2 Two review different properties of Nuclear forces like charge independence, spin dependence, tensor character and exchange character.</p> <p>C O 3 To study Meson exchange theory and many body potential that describes the nuclear forces.</p>

C O 4	To analyse the n-p and p-p scattering at low energies using partial wave analysis and to understand the spin dependence of nuclear forces.
C O 5	To learn the effective range theory, coherent scattering and examples for hydrogen in scattering studies.
C O 6	To compare the theoretical understandings and predictions with the experimental results of n-p and p-p scattering.
C O 7	To study quantitatively the Fermi gas model, Independent particle model, the collective model and the Nilsson model.

<b>Department Name:</b>	<b>P 580 M.Sc. (Chemistry)</b>
<b>PROGRAMME OUTCOMES</b>	
PO 1: Inculcate critical thinking to carry out scientific investigation objectively in industry and academia by following scientific approach to knowledge development. PO 2: Equip the student with necessary skills to analyse scientific problems, formulate hypothesis, evaluate and validate results, and draw conclusions from the data obtained PO 3: Equip the student with the knowledge for clear understanding of the subject related concepts to lead them for interdisciplinary and trans disciplinary research PO 4: Induce the sense of professional and ethical responsibility and enhance the cross cultural competency PO 5: Demonstrate an understanding of major concepts in all disciplines of chemistry PO 6: Get an awareness of the impact of chemistry on the environment, society, and other cultures outside the scientific community	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
PSO 1: To acquire basic knowledge of the analytical chemistry of important techniques that will provide the basis for their industrial production methods. PSO 2: To provide an adequate mastery of analytical methods used for the determination of commercial/domestic raw materials and finished product quality. PSO 3: To Able to carry out independent research through application of spectroscopic knowledge which in turn facilitates the submission of project/research article. PSO 4: Able to successfully prepare for the competitive examinations like CSIR-NET, GATE and State Level eligibility test for Lectureship PSO 5: Develop strong analytical skills and strong background in the Chemical sciences to join Chemical and Pharmaceutical industry PSO 4: Able to successfully prepare for the competitive examinations like CSIR-NET, GATE and State Level eligibility test for Lectureship	
<b>Subject and code: PH 581.1: INORGANIC CHEMISTRY</b>	
<b>Course Outcomes:</b>	
. Student will be able to: <ul style="list-style-type: none"> <li>• Explain the chemistry of acids, bases, non-aqueous solvents and the concepts of hard and soft acids and bases</li> <li>• Describe the types of bonds and molecular shape of compounds with emphasis on VSEPR, VB and MO theory of complexes.</li> <li>• Discuss the properties of the non-transition elements like C, B and Si and their frameworks</li> </ul>	

<ul style="list-style-type: none"> <li>• Illustrate the properties and justify the anomalies of Nitrogen, Phosphorus, Sulphur and noble gas compounds.</li> </ul>
<b>Subject and code: PH 582.1 : ORGANIC CHEMISTRY</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>• Explain the basic concepts of organic chemistry and the forces of attraction between different molecules.</li> <li>• Explain the reaction intermediates and mechanisms.</li> <li>• Demonstrate the importance of conformation and stereochemistry in understanding the reactivity and stability of organic molecules</li> <li>• Detail the synthesis and stereochemistry of carbohydrates</li> </ul>
<b>Subject and code: PH 583.1: PHYSICAL CHEMISTRY</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>• Understand the basic concepts of thermodynamics and its applications.</li> <li>• Recollect the basics and understand fundamental ideas of chemical kinetics and its applications</li> <li>• Familiarize with the various concepts in heterogeneous catalysis.</li> <li>• Study and apply the principle and applications of electrochemistry</li> </ul>
<b>Subject and code: PS 584.1 : PRINCIPLES OF ANALYTICAL CHEMISTRY &amp; SEPARATION TECHNIQUES</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>• Imbibe knowledge about various sampling techniques and errors.</li> <li>• Evoke the fundamental concepts of different titration techniques</li> <li>• Understand the principle of different chromatography techniques and apply that knowledge for the separation and purification of various samples</li> </ul>
<b>Subject and code: PS 585.1 BIO-ORGANIC CHEMISTRY</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>• Understand the chemical principles of living cells, the biomolecules and biocatalytic reactions.</li> <li>• Study the basic principles underlying the chemistry of nucleic acids.</li> <li>• Explain the structure determination, synthesis and classification of biomolecules like vitamins and lipids</li> </ul>
<b>Subject and code: PS 586.1 RESEARCH METHODOLOGY</b>
<b>Course Outcomes:</b>
Student will be able to: Evaluate Research output with philosophical base and greater relevance to the society Identify the parameters of Quality research with scientific methodology Understand the concepts involved in Original Research, ethical guidelines and practices in conducting the research and publication of papers. Create awareness on Intellectual property Rights and Patents.
<b>Subject and code: PS 587.1P: INORGANIC CHEMISTRY PRACTICALS – I</b>
<b>Course Outcomes:</b>
Student will be able to:

<ul style="list-style-type: none"> <li>Estimate the quantity and quality of different compounds and metal ions using gravimetry, volumetry and complexometric techniques.</li> </ul>
<b>Subject and code: PS 588.1P : ORGANIC CHEMISTRY PRACTICALS - I</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>Carry out multi-step organic synthesis</li> <li>Purify the synthesized organic compounds</li> </ul>
<b>Subject and code: PS 589.1P : PHYSICAL CHEMISTRY PRACTICALS – I</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>Carry out experiments related to chemical kinetics, viscometry, Polarimetry, Refractometry, Conductometry and Potentiometry</li> </ul>
<b>Semester-2</b>
<b>Subject and code: PH 581.2: ADVANCED INORGANIC CHEMISTRY</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>Understand the Chemistry of d block elements, Lanthanides and Actinides and explain their magnetic and electronic properties</li> <li>Describe the VB and MO theory of complexes and electronic and bonding reactivities of transition metals</li> <li>Explain the spectral and magnetic properties of metal complexes</li> <li>Describe the basic concepts of organometallic chemistry and their bonding patterns especially with unsaturated ligands</li> </ul>
<b>Subject and code:PH 582.2: ADVANCED ORGANIC CHEMISTR</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>Describe the mechanisms of different types organic reactions.</li> <li>Understand the chemistry of radical reactions and its applications.</li> <li>Understand the mechanism of additions to various Carbon-based multiple bonds</li> <li>Achieve skills in constructing homo/heterocyclic rings of significant molecules</li> </ul>
<b>Subject and code:PH 583.2: ADVANCED PHYSICAL CHEMISTRY</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>Gather knowledge of Quantum Chemistry and its application</li> <li>Explain the approximation methods in quantum mechanics</li> <li>Explain the relationship between microscopic properties of molecules with macroscopic thermodynamic observables</li> <li>Describe the quantum mechanical explanation of chemical bonding</li> </ul>
<b>Subject and code:PS 584.2: MOLECULAR SYMMETRY AND MOLECULAR SPECTROSCOPY</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>Apply the principles of group theory in chemical bonding.</li> <li>Define aspects of specific spectroscopic techniques, applications of molecular symmetry in Microwave and Vibrational spectroscopy</li> <li>Define aspects of specific spectroscopic techniques, applications of molecular symmetry in Rotational and Raman spectroscopy</li> </ul>

<b>Subject and code:PS 585.2 : CHEMISTRY OF BIOMOLECULES</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>• Explain the structure and role of biomolecules like peptide, proteins and lipids</li> <li>• Understand the chemical principles of living cells, their biomolecules and biocatalytic reactions.</li> <li>• Detail the synthesis and stereochemistry of carbohydrates</li> </ul>
<b>Subject and code:PS 586.2P : INORGANIC CHEMISTRY PRACTICALS – II</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>• Estimate binary mixtures of metallic ions in solution</li> <li>• Analyse the presence of inorganic salts qualitatively</li> </ul>
<b>Subject and code:PS 587.2P : ORGANIC CHEMISTRY PRACTICALS – II</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>• Separate and analyse the binary mixture of Organic Compounds</li> </ul> Separation and Systematic Qualitative Analysis of Binary Mixtures of Organic Compounds
<b>Subject and code:PS 588.2P : PHYSICAL CHEMISTRY PRACTICALS – II</b>
<b>Course Outcomes:</b>
Course Outcome: Student will be able to: <ul style="list-style-type: none"> <li>• Determine cryoscopic constants, dissociation constants and various other physical properties of compounds</li> </ul>
<b>Subject and code:PO 589.2- SPECTRAL METHODS OF ANALYSIS</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>• Understand theory and application to mass spectrometry, ultraviolet and visible spectroscopy</li> <li>• Understand infrared spectroscopy, X Ray and</li> <li>• Gain a basic understanding of nuclear magnetic resonance spectroscopy</li> </ul>
<b>Semester-III</b>
<b>Subject and code:PH 581.3: ORGANOMETALLIC, BIOINORGANIC AND COORDINATION CHEMISTRY</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>• Describe the basic concepts, synthesis, reaction chemistry of organometallic compounds and the structure and bonding patterns.</li> <li>• Detail the mechanism of different organometallic reactions and catalysis and their application as industrial catalysts.</li> <li>• Understand the nomenclature, metal-ligand reactions and their mechanism and identify the bonding, structure, and reactivity of selected coordination complexes.</li> <li>• Understand the role and interaction of Metal ions in biological systems.</li> </ul>
<b>Subject and code:PH 582.3: ELECTROCHEMISTRY AND THERMOANALYTICAL METHODS</b>
<b>Course Outcomes:</b>
Student will be able to:

- Detail the structure of electrode-electrolyte interface with various models such as Helmholtz - Perrin, Gouy - Chapman and Stern model of electrical double layers.
- Describe the physical principles of Photo electrochemistry and its classification.
- Understand the basic principles of corrosion science.
- Describe the methods of corrosion protection and explain the principles of corrosion protection.

**Subject and code: PS 583.3: MOLECULAR SPECTROSCOPY**

**Course Outcomes:**

Student will be able to:

- Gather knowledge about various spectroscopic techniques such as IR, NMR UV and Mass spectroscopy analysis.
- Understand theory and application to mass spectrometry, ultraviolet and visible spectroscopy, infrared spectroscopy, nuclear magnetic resonance spectroscopy.
- Apply NMR, IR, MS, UV-Vis spectroscopic techniques in solving structure of organic molecules.

**Subject and code: PS 584.3 :MEDICINAL CHEMISTRY**

**Course Outcomes:**

Student will be able to:

- Explain the mechanism of drug action and drug designing.
- Understand the classification, structure and mechanism of drugs action.
- Develop an understanding on various CNS depressants

**Subject and code:PS 585.3P: COMPUTERS FOR CHEMISTS - PRACTICALS**

**Course Outcomes:**

Student will be able to:

- Understand about the different operating systems and software's
- Get a training on using subject specific software's.
- Get hands-on experience to use the relevant software's

**Subject and code: PS 586.3P: INORGANIC CHEMISTRY PRACTICALS – III**

**Course Outcomes:**

Student will be able to:

- Estimate binary mixtures of metallic ions in solution
- Detect presence of certain type of ions in water.

**Subject and code:PS 587.3P ORGANIC CHEMISTRY PRACTICALS – III**

**Course Outcomes:**

Student will be able to:

- Separate and perform systematic qualitative analysis of binary mixtures of organic compounds containing both mono and bifunctional groups and preparation of suitable derivatives.

**Subject and code: PS 588.3P : PHYSICAL CHEMISTRY PRACTICALS – III**

**Course Outcomes:**

Student will be able to:

- Carry out experiments related to chemical kinetics, Polarimetry, Conductometry and Potentiometry

**Subject and code: PO589.3 - BIO-INORGANIC CHEMISTRY, GREEN CHEMISTRY AND ENVIRONMENTAL CHEMISTRY****Course Outcomes:**

Student will be able to:

- Understand the role and interaction of Metal ions in biological systems.
- Understand the principle and importance of green chemistry.
- Identify environmental problems related to pollution, identify and utilize eco-friendly methods to protect it, understand and apply green chemical methods solve the problems related to environmental pollution.

**Semester-IV****Subject and code: PH 581.4: ORGANIC SYNTHETIC METHODS****Course Outcomes:**

Student will be able to:

- Understand and apply the various reagents in organic synthesis and design organic synthetic reactions.
- Describe the applications of oxidation and reduction techniques in organic synthesis.
- Prefer suitable reagent for important reactions/building appropriate bonds.
- Understand the principles and applications of protecting groups in chemistry.

**Subject and code: PH 582.4 : RADIATION AND PHOTOCHEMISTRY****Course Outcomes:**

Student will be able to:

- Demonstrate a systematic understanding of the key aspects of nuclear chemistry and their analytical applications
- Acquire knowledge of nucleus, nuclear reaction, radioactive techniques and application of radioisotopes.
- Describe the methods of measurements and kinetics of photochemical reactions
- Discuss the principle of absorption and emission of radiation and explain the mechanism of Jablonski diagram

**Subject and code: PH 583.4: CHEMISTRY OF POLYMERS AND NATURAL PRODUCTS****Course Outcomes:**

Student will be able to:

- Understand preparation methods, property uses of some industrially important polymers.
  - Describe the morphology, structure thermal, physical, and mechanical properties of polymers.
  - Gather knowledge about the classification, isolation techniques, understand the various synthetic approaches in Natural Products synthesis structural elucidation of natural products.
  - Explain the basics and applications of concerted reactions and pericyclic reactions.
- Develop an in-depth knowledge of the basics and applications with mechanistic understanding in concerted reactions apply those in the synthesis of organic compounds.

**Subject and code: PS 584.4P ORGANIC CHEMISTRY PRACTICALS – IV****Course Outcomes:**

Student will be able to:

- Detail the various organic reactions and their synthetic procedures.

<ul style="list-style-type: none"> <li>Analyze the separation processes of various organic compound mixtures and their quality checking processes</li> </ul>
<b>Subject and code:PS 585.4P : INORGANIC CHEMISTRY PRACTICALS – IV</b>
<b>Course Outcomes:</b>
Student will be able to: <ul style="list-style-type: none"> <li>Estimate binary mixtures of metallic ions in solution.</li> <li>Study structure of the prepared complexes using conductance and magnetic susceptibility measurements, recording the electronic and infrared spectra:</li> </ul>
<b>Subject and codePS 587.4 : SOLID STATE AND NANO CHEMISTRY</b>
<b>Course Outcomes:</b>
Course Outcome: Student Will be able to: <ul style="list-style-type: none"> <li>Understand the theory of diffraction techniques</li> <li>Gain a domain knowledge about crystal systems and defects</li> <li>Understand the importance and basic concepts of Nano Chemistry</li> </ul>
<b>Subject and code:PS 588.4 :OPTICAL METHODS OF ANALYSIS</b>
<b>Course Outcomes:</b>
Course Outcome: Student Will be able to: <ul style="list-style-type: none"> <li>Understand the theory of diffraction techniques</li> <li>Gain a domain knowledge about crystal systems and defects</li> <li>Understand the importance and basic concepts of Nano Chemistry</li> </ul>
<b>Subject and code:</b>
<b>Course Outcomes:</b>
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<b>Subject and code:</b>
<b>Course Outcomes:</b>

<b>Department Name:</b>	<b>P 590 M.Sc. (Food Science and Technology)</b>
<b>PROGRAMME OUTCOMES</b>	
PO 1 Scientific Knowledge: Knowledge on the fundamentals of food science and nutrition, food chemistry and biochemical changes during processing and preservation, nutraceuticals, also students will be able to understand and apply sensory evaluation of food. PO 2 Design/development of solutions: Design solutions for complex food engineering problems or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. Students will also develop an ability to work in modern tools and equipment's to analyze food composition, identify microorganism responsible for food spoilage.	

PO 3 Problem analysis: Understand the principles behind analytical techniques used in evaluating the biochemical properties of food; they will be able to identify the microorganism responsible for food spoilage and the methods to control the food spoilage.

PO 4 Modern tool usage: Demonstrate knowledge in various engineering properties of food and its application in food industry, concept of mass balance and energy balance, unit operations in food processing, conventional and advanced methods of food preservation, methods of packing, post-harvest practices so as to develop food products and develop device for food industry.

PO 5 Skill development and application: Develop specific skill based on their interest in bakery and confectionery, meat, poultry and fish processing, food fermentation, dairy processing. Students will also be able to apply the principles of Hazard Analysis and Critical Control Points (HACCP) to ensure safe food processing. Students will also have knowledge in regulations governing the manufacture and sales of the food products.

PO 6 Research capabilities and Project management: Demonstrate the ability to apply knowledge through critical thinking, inquiry, analysis, and communication to produce scholarly and creative works in the form of an original oral scientific presentation, master's thesis/report, scientific manuscript for wide publication; participate as a member and leader in a team in order to manage multidisciplinary projects.

PO 7 Ethics: Demonstrate awareness of their responsibilities (professional integrity, ethical behavior, etc.) and commit to the highest standards of academic and professional integrity and ethical values.

PO 8 Environment and sustainability: Comprehend the impact food technologies and food waste processing solutions in societal and environmental contexts and promulgate the knowledge to strategize various approaches for sustainable development.

PO 9 Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings which are basic qualities for a Food technologist.

PO 10 Interpersonal Skills: Listening and effective speaking on food science problem with the small, medium and large-scale food business operators and with the society at large. For instance, ability to comprehend and published effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11 Life-long learning: Identify the need for and be prepared to engage in independent and life long learning in the most extensive context of methods and technological advancement in the field of food science and technology.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO 1 To inculcate technical writing and communicating ability for effective documentation and presentations and develop strong research aptitude through research work to enable the students to opt for higher levels of learning in the field of Food Science and Technology.

PSO 2 To acquaint and equip students with professional and intellectual integrity, ethics of research and scholarship, impact of research outcomes on professional practices and responsibilities to contribute positively in the sustainable development of society.

PSO 3 To enable the students to get engaged in lifelong learning independently with the vigor and zeal and becomes capable to start-up their own businesses.

**Subject and code: PH 591.1: Food Chemistry**

#### **Course Outcomes:**

CO 1  
Know the chemistry underlying the properties and reactions of various food components

CO 2 Have sufficient knowledge of food chemistry to control reactions in foods.

CO 3 Know the major chemical reactions that limit shelf life of foods.

CO 4 Use the laboratory techniques common to basic and applied food chemistry.
CO 5 Know the principles behind analytical techniques associated with food.
<b>Subject and code: PH 592.1 Principles of Food Processing and Preservation</b>
<b>Course Outcomes:</b>
CO 1 Describe the source and variability of raw food material and their impact on food processing operations.
CO 2 Explain the spoilage and deterioration mechanisms in foods and methods to control deterioration and spoilage.
CO 3 Describe the unit operations required to produce a given food product.
CO 4 Explain the principles and current practices of processing techniques and the effects of processing parameters on product quality.
<b>Subject and code:PH 593.1 Fruits and Vegetables Processing Technology</b>
<b>Course Outcomes:</b>
CO 1 Better understanding of the concepts of physiological characteristics of fruits and vegetables.
CO 2 Better insight about fruit losses during storage and ways to prevent it.
CO 3 Thorough Knowledge and understandings of the specific processing technologies used for different foods and the various products derived from these materials.
CO 4 The students acquire insight into specific product and process related factors in the processing of fruits and vegetables.
<b>Subject and code:PS 596.1 Processing of Milk and Dairy Products</b>
<b>Course Outcomes:</b>
CO 1 Understand the processes related to storage, processing and distribution of milk and milk products.
CO 2 Perceive the different properties of milk and milk products and apprehend the thermal processing of milk.
CO 3 Grasp the technology of fat rich dairy products and Comprehend the technology of condensed milk, dried milk, cheese, yoghurt and indigenous products will be understood.
CO 4 Have knowledge regarding hygiene and sanitation practices in the milk and milk products industry.
<b>Subject and code:PS 597.1 Waste Management and Environmental Sustainability</b>
<b>Course Outcomes:</b>
CO 1 Learn physical/ chemical/biological characteristics of and the evaluation technique form various industrial waste water.
CO 2 Understand the theory, engineering application, and design technique for the industrial wastewater treatment unit processes.
CO 3 Design various environmental structures like water treatment plants, waste water treatment systems and air pollution control equipment's.
CO 4 Know solid waste remedial measures and their importance and Undertake projects related to solid waste management.
CO 5 Make decision based on the environmental consequences of proposed actions and promote environmentally sound and sustainable development by identifying appropriate measures.
CO 6 A sound understanding of the principal environmental policy issues confronting managers in diverse geographical and culture situations.
CO 7 A range of relevant practical skills, particularly in the fields of impact assessment, audit and law.

Semester-II
<b>Subject and code:PH 591.2 Food Process Engineering and Instrumentation</b>
<b>Course Outcomes:</b>
CO 1 Comprehend the recent advancement in the major cereal grains' quality and processing aspects. CO 2 Understand the mechanism underlying the interaction of various flour components and their role in end use quality. CO 3 Grasp the basic and advanced milling methods for wheat, rice, maize. CO 4 Know about by-product utilization of various grains. CO 5 Comprehend the recent advancement in the major cereal grain's quality and processing aspects.
<b>Subject and code:PH 592.2 Processing Technology of Cereals, Pulses and Oil Seeds</b>
<b>Course Outcomes:</b>
CO 1 Students will be able to identify and describe various processing techniques for cereals, pulses, and oil seeds, including cleaning, sorting, grading, milling, and extrusion. CO 2 Students will be able to evaluate the quality of processed cereal, pulse, and oil seed products, including factors such as nutritional value, sensory attributes, and shelf life. CO 3 Students will be able to identify and describe the equipment and machinery used in cereal, pulse, and oil seed processing, and understand their functions and operating principles. CO 4 Students will have a good understanding of the safety and hygiene considerations involved in cereal, pulse, and oil seed processing, including food safety regulations, hazard analysis, and critical control point (HACCP) procedures. CO 5 Students shall be able to develop processing strategies for specific cereal, pulse, and oil seed products, taking into account factors such as raw material quality, processing parameters, and end-product requirements.
<b>Subject and code:PS 595.2 Spices and Plantation Crops Technology</b>
<b>Course Outcomes:</b>
CO 1 Students will understand practical knowledge on specialized production techniques of vegetables and spices. CO 2 Students understand will Importance of vegetables & spices in human nutrition improved and national economy. CO 3 Students will be acquainted with the knowledge of profitable crop Production technology. CO 4 To understand the scientific cultivation methods of plantation crops like coconut, arecanut, cashew, tea, coffee & rubber. CO 5 To know more about origin, area, climate, soil, improved varieties and cultivation practices such as time and methods of sowing, transplanting techniques, planting distance, fertilizer requirements, irrigation, weed management, harvesting and yield.
<b>Subject and code:PS 596.2 Research Methodology and Ethics</b>
<b>Course Outcomes:</b>
CO 1 To understand the intricacies of each micronutrient in growth and development of humans

CO 2 To understand the basis of human nutritional requirement and recommendations through the life cycle
CO 3 To analyze the nutrient – nutrient and nutrients – drug interaction. Students will be familiar with factors affecting for the absorption of nutrients
CO 4 To understand the implications of deficiency and toxicity of micronutrients and to assess their status in the body
CO 5 Demonstrate knowledge of research processes (reading, evaluating, and developing)
CO 6 Perform literature reviews using print and online databases
<b>Subject and code:PO 598.2 Essentials of Food Science</b>
<b>Course Outcomes:</b>
CO 1 Understand the history and evolution of food processing
CO 2 Acquire knowledge of the structure, composition, nutritional quality and post-harvest changes in various plant foods.
CO 3 Understand the structure and composition of various animal foods.
<b>Semester-III</b>
<b>Subject and code:PH 591.3 Food Microbiology</b>
<b>Course Outcomes:</b>
CO 1 Learn the fundamentals of food microbiology.
CO 2 Identify the novel methods for detection of immunological components.
CO 3 Acquire the knowledge on various criteria for microbiological assessments in various food products
<b>Subject and code: PH 592.3 Nutraceuticals and Functional Foods in Human Health</b>
<b>Course Outcomes:</b>
CO 1 Acquire knowledge on various bio molecules showing health benefits.
CO 2 Understand various physiological and biochemical aspects of life threatening and chronic diseases.
CO 3 Apply their knowledge regarding extraction, isolation, characterization and application of nutraceuticals in food industries.
CO 4 Identify various aspects about safety, quality and toxicology of food products including, nutraceutical and functional foods.
<b>Subject and code: PO 595.3 Basics of Food Safety and Labelling</b>
<b>Course Outcomes:</b>
CO 1 Understand the concept of food safety, types of hazards and their control measures.
CO 2 Identify and prevent potential sources of food contamination and comprehend the need of hygiene and sanitation for ensuring food safety.
CO 3 Understand National and International Food Safety Laws and Regulations.
CO 4 Practical knowledge to detect and quantify microorganisms from various routes of contamination of food.
CO 5 Understand various areas of Food Safety & Quality Assurance.
CO 6 Grasp knowledge of the quality assessments of food products.
CO 7 Comprehend food quality managements systems.
CO 8 Apprehend the Indian and International food laws.
CO 9 Conceive the concept of adulteration in food products.
<b>Semester-IV</b>
<b>Subject and code: PH 591.4 Meat, Fish, and Poultry Processing Technology</b>

<b>Course Outcomes:</b>
CO 1 Understand the need and importance of livestock, egg and poultry industry CO 2 Understand the structure, composition and nutritional quality of animal products. CO 3 Understand the concept and methods of processing and preservation of animal foods. CO 4 Understand the technology behind preparation of various animal food products and by-product utilization CO 5 Understand egg production practices and egg preservation methods CO 6 Understand factors affecting egg quality and measures of egg quality.
<b>Subject and code: PH 592.4 Food Packaging</b>
<b>Course Outcomes:</b>
CO 1 Comprehend the overview of the scientific and technical aspects of food packaging CO 2 Understand packaging machinery, systems, testing CO 3 An insight to food packaging laws and regulations CO 4 An understanding of packaging requirement and packaging designing of food.
CO 5 Comprehend advance knowledge on the properties and production of various packaging materials and effect of various indicators used in supply chain management to indicate the food quality CO 6 Understand various types of scavengers and emitters for improving the food shelf life. CO 7 Learn about consumer response about new packaging systems and safety and legislative requirements CO 8 Acquaint about food-package interaction between package-flavour, gas storage systems for food storage, recycling and use of green plastics for reducing the pollution and their effect on food quality.
<b>Subject and code:</b>
<b>PH 593.4 Food Biotechnology</b>
<b>Course Outcomes:</b>
CO 1 Students shall become aware of fundamentals of food biotechnology, genetics and also gain basic knowledge of cell culture technology. CO 2 Have developed an understanding of the application of biotechnology in animal, plant and food production. CO 3 Have acquired practical skills in using nucleic acids sequences and bioinformatics data on computers. CO 4 Be able to recommend appropriate measures to solve technical problems
<b>Subject and code: PS 595.4 Food Safety and Quality Control</b>
<b>Course Outcomes:</b>
CO 1 Understand, use and apply the knowledge, skills of quality management in food processing. CO 2 Understand and critically evaluate the presence of contaminants in food quality assurance. CO 3 Understand the chemical, technological and toxicological aspects of food additives in food preservation. CO 4 Understand the concept of food safety, types of hazards and their control measures

CO 5    Comprehend the need of hygiene and sanitation for ensuring food safety
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<b>Department Name:</b>	<b>P 600 A        M.C.A.</b>
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<b>PROGRAMME OUTCOMES</b>
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PE01    Excel in professional career and/or higher education by acquiring knowledge in various sub-domains related to the field of computer science and applications PE02    Analyze real life problems, design computing systems appropriate to its solutions that are technically sound, economically feasible and socially acceptable PE03    To develop the abilities to face the changing trends and career opportunities in computer application PE04    Exhibit professionalism, ethical attitude, communication skills, team work in their profession and adapt to current trends by engaging in life long learning
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<b>PROGRAMME SPECIFIC OUTCOMES</b>
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PO1    Computational Knowledge: Apply knowledge of mathematics, computing fundamentals, data analytics, software engineering concepts and application development knowledge appropriate for the computing specialization PO2    Problem Analysis: Identify, formulate, design and develop applications to analyze and solve computer science related problems  PO3    Design /Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.  PO4    Conduct investigations of complex Computing problems: Use appropriate review literatures, research methodologies, techniques and tools, design, conduct experiments, analyze and make inferences from the resulting data.  PO5    Modern Tool Usage: Create, Select, Integrate and apply efficiently appropriate techniques, resources, and modern computing tools to solve complex problem, with an understanding of the limitations.  PO6    Professional Ethics: Understand and work with a professional context pertaining to ethics with appropriate societal and cyber regulations in a global economic environment  PO7    Life-long Learning:
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Recognize and develop the passion for a continued career development and progress as a computer professional

**PO8 Project management and finance:**

Apply the principles of management with computing knowledge to manage the projects effectively both as a team leader and team member on multidisciplinary environments

**PO9 Communication Efficacy:**

Communicate effectively with the computing community as well as society by being able to make effective presentations and design documentation with respect to appropriate standards.

**PO10 Societal and Environmental Concern:**

Ability to utilize the computing knowledge efficiently in projects to analyze the global and local impact of business solutions for societal, environmental, and cultural aspects

**PO11 Individual and Team Work:**

Develop the ability to act as a member or leader for the fulfillment of diverse teams in multidisciplinary environments.

**PO12 Innovation and Entrepreneurship:**

Develop and design innovative methodologies to create value as a successful entrepreneur and wealth for betterment of individual and society at large.

**Subject and code:PH 601.1 [E1] : DATABASE MANAGEMENT SYSTEMS**

**Course Outcomes:**

1. Very good understanding about data and database systems.
2. Describe the fundamental elements of relational database management systems
3. Understand the design of relational databases through the use of Entity-Relationship Diagrams and Normalization procedures
4. Develop basic skills in the use of SQL in defining and creating a database, inserting and modifying entries in a table, creating views and other data objects
5. Effective way of manipulating the database to produce useful decision making information for management & analytics. Using data in the distributed environment

**Subject and code:**

PH 601.1 [E2] : DATABASE DESIGN AND IMPLEMENTATION

**Course Outcomes:**

1. Understand the limitations of traditional file management systems, different data models
2. Understand the need for an efficient management system to administer the data repository of any organization, designing relational database systems with normalization concept
3. Identify the importance of data consistency and also how data integrity ignorance affects any business organization
4. Providing data security through different means (such as Views)
5. Identifying the power of Query language - generating flexible and customized reports
6. Providing complex integrity constraints through the use of Triggers

7. Know the Power of procedural SQL, writing Stored procedures, functions and packages
8. Gain knowledge about the emerging trends in database technology and also schema less database

**Subject and code:** PH 601.1 [E3] : NoSQL with MongoDB

**Course Outcomes:**

After successful completion of the course students should be able to

1. Understand that data need not be structured for storage, retrieval and manipulation
2. Define, compare and use the four types of NoSQL Databases (Document-oriented, Key Value Pairs, Column-oriented and Graph).
3. Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases.
4. Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.
5. Using NoSQL tools efficiently in the academic projects
6. Understands different types of Indexing/shading and marinating NoSQL data. Comparing the power of different NoSQL tools

**Subject and code:** PH 602.1 [E1] DATA STRUCTURES AND ANALYSIS OF ALGORITHMS

**Course Outcomes:**

1. Ability to understand and implement algorithms and are able to calculate the time and space complexities.
2. Able to implement and apply stack and queue data structure in different applications.
3. Ability to implement linked list and concepts and apply list concepts to solve different problems.
4. Ability to implement tree data structure and tree data structure to solve expressions
5. Ability to implement and apply different searching and sorting methods.

**Subject and code:** PH 602.1 (E2) DATA STRUCTURES AND GRAPH THEORY

**Course Outcomes:**

1. Ability to program using structures, function pointers, classes and objects.
2. Ability to implement and apply stack, queue and list data structures in different applications.
3. Ability to implement and apply tree data structure in different applications
4. Ability to program different searching and sorting methods and how to apply these in different applications
5. Ability to implement and apply different graph methods in different applications

**Subject and code:** PH 602.1 (E3) ADVANCED DATA STRUCTURES AND ALGORITHMS

**Course Outcomes:**

1. Understand what is data structure and able to implement different programs using structures, functions, pointer and memory allocation functions
2. Skill to program stack, queue using array and apply these algorithms to different applications.
3. Ability to program binary tree, binary search tree, AVL tree and other tree data structures and traverse and represent expressions using tree data structure.

4. Ability to program different searching and sorting algorithms using cpp programming language.
5. Ability to create graph using array and using linked list. Ability to find shortest path in graph, able to traverse the graph

**Subject and code: PH 603.1 [E1]: OBJECT ORIENTED PROGRAMMING WITH JAVA**

**Course Outcomes:**

1. Develop simple Java applications using control structures
2. Design user defined classes and create instances for them. Learn to invoke methods on those objects. Create programs to execute various methods of String and StringBuffer classes.
3. Develop applications to illustrate simple inheritance and multilevel inheritance. Simulate multiple inheritance with the help of interfaces.
4. Develop programs to illustrate synchronization between multiple threads. Also to handle exceptions caused by them.
5. Students will be able to build Java applications where they can read from and write to files. Design generic classes and test them.

**Subject and code: PH 603.1 [E2] : ENTERPRISE COMPUTING WITH ADVANCED JAVA**

**Course Outcomes:**

Course Outcomes:

1. To analyze various JEE components. To understand about distributed applications
2. To Develop server side programs using Servlets
3. To Develop server side web applications using JSP
4. Update and retrieve the data from the databases using Apache Derby
5. Create session and entity beans using EJB

**Subject and code: PH 603.1 [E3]: ENTERPRISE COMPUTING: JAVA EE Frameworks**

**Course Outcomes:**

Course Outcomes:

1. Developing server side web applications using Servlet, JSP,
2. Update and retrieve the data from the databases using Apache Derby. Develop web applications using various JSTL tags
3. Develop enterprise applications using EJB
4. Create simple web applications using JSF framework
5. Map Java classes to database tables using Hibernate

**Subject and code: PH 604.1 [E1]: WEB DESIGN with HTML 5, CSS, Java Script**

**Course Outcomes:**

Learning Outcomes: At the end of the course, the

- Students will be able to develop websites and web based projects.
- Students can be employed on entry-level jobs of web development in software industry.
- Students will be able to develop interactive and dynamic webpages

**Subject and code: PH 604.1[E2]: WEB PROGRAMMING WITH PHP and MYSQL**

**Course Outcomes:**

Course Outcomes:

1. Students will be able to develop static webpages using HTML elements
2. Students will be able to design HTML forms. Perform graphics design using CANVAS, SVG. They will be able to play audio and video in web pages

3. Ability to style HTML pages using CSS 4. Develop simple JavaScript programs 5. Ability to develop interactive web pages using JavaScript
<b>Subject and code: PH 604.1[E3] WEB APPLICATION DEVELOPMENT USING PYTHON</b>
<b>Course Outcomes:</b>
At the end of this course students will be able 1. To define the structure and components of a Python program and to design and program Python applications. 2. To learn how to use lists, tuples, dictionaries in Python programs, to read and write files in Python, to design object oriented programs with Python classes. 3. To learn how to use exception handling in Python applications for error handling and do CRUD operations. 4. To use various libraries in Python and successfully configure and install Django framework 5. To develop a secure and robust web applications using Django framework
<b>Subject and code: PH 605.1 P DBMS and Data Structures Lab</b>
<b>Course Outcomes:</b>
Course Outcomes: At the end of the course, the candidate will be able to learn <ul style="list-style-type: none"> <li>To implement the data structures at the systems level</li> <li>Manage the Time and Space Complexity of the programmes</li> <li>Comprehend the art of programming and, the structure and meaning of basic Java programs,</li> <li>Design and build programs using problem-solving techniques such as top-down design,</li> <li>Modify, compile, debug, and execute Java programs,</li> <li>Understand how to create graphical interfaces and Java applets for a Web page</li> <li>Create databases using popular database management system products</li> <li>Solve problems by constructing database queries using the Structured Query Language</li> <li>Develop insights into future data management tool and technique trends</li> <li>Recommend and justify strategies for managing data security, privacy, audit/control, fraud detection, backup and recovery</li> </ul>
<b>Subject and code: PS 606.1 [E1] STATISTICAL TECHNIQUES FOR COMPUTING</b>
<b>Course Outcomes:</b>
1. Select appropriate statistical techniques for summarizing and displaying data 2. Analyze and draw inferences from data using appropriate statistical methods. 3. Analyze the dispersion in the data and draw inference. 4. Understand the concept of a frequency distribution for sample data, and be able to summarize the distribution by diagrams and statistics. 5. Understand correlation and regression, and be able to make predictions and understand their limitations.
<b>Subject and code: PS 606.1 [E2] PROBABILITY AND STOCHASTIC PROCESS</b>
<b>Course Outcomes:</b>
1. Calculate the probabilities and identify the various types. 2. Apply inverse probability concepts and solve problems. 3. express the features of discrete random variables and formulate the distribution functions.

4. Identify the various distributions and apply them.
5. Classify a stochastic process according to whether it operates in continuous or discrete time and whether it has a continuous or a discrete state space. To Understand the concept of Markov chains and study the transition diagram.
<b>Subject and code: PS 606.1 [E3] OPERATIONS RESERACH</b>
<b>Course Outcomes:</b>
1. Calculate the probabilities and identify the various types.
2. Apply inverse probability concepts and solve problems.
3. express the features of discrete random variables and formulate the distribution functions.
4. Identify the various distributions and apply them.
5. Classify a stochastic process according to whether it operates in continuous or discrete time and whether it has a continuous or a discrete state space.
6. To Understand the concept of Markov chains and study the transition diagram.
<b>Subject and code: PS 607. 1 P Java &amp; Web Development Lab</b>
<b>Course Outcomes:</b>
1. Use the Java SDK & JRE Environment to Create, Debug and Run Simple Java Programs.
2. Analyze the Problem, Identify the Requirements & Features of Applications and Utilities
3. Implement Object Oriented Concepts for Solving Real Problem.
4. Develop Small Applications, Utilities, and Web Applications Using AWT, Event and Layout Manager
<b>Subject and code: PS 608.1 Business Communication/Entrepreneurship</b>
<b>Course Outcomes:</b>
Course Outcome : At the completion of this unit, students will:
<ul style="list-style-type: none"> <li>Understand the business models that underlie Cloud Computing</li> <li>Understand the importance of protocols and standards in computing.</li> <li>Understand the issues involved in distributed computing</li> <li>Ability to deploy applications using the Unicore Grid middleware</li> <li>Ability to programme using the APIs of Cloud Computing</li> <li>Ability to created Virtual Machine images and to deploy them on a Cloud.</li> </ul>
<b>Semester-II</b>
<b>Subject and code: PH 601.2 [E1] CLOUD COMPUTING WITH AMAZON WEB SERVICES</b>
<b>Course Outcomes:</b>
1. Describe the key technologies, architecture, strengths, limitations and applications of cloud computing
2. Explain the types and service models of cloud.
3. Understand security implications in cloud computing
4. Design Cloud Services and Set a private cloud
5. Create and automate infrastructure to design cost-effective, highly available applications
6. Integrate AWS services with your application to meet and exceed non-functional requirements
<b>Subject and code: PH 601.2 [E2] Grid and Cluster Computing</b>
<b>Course Outcomes:</b>
At the end of the course students are able to
1. understand fundamentals of cluster computing and Environments
2. To enable resource sharing across networks.

3. To integrate heterogeneous computing systems and data resources with the aim of providing a global computing space.
4. To manage and schedule the resources in grid environments.
5. To know the standards and protocols used.
6. To Know the middleware in grid computing.
7. To understand the latest advances in the field of computation to optimize the utilization of resources.

**Subject and code: PH 601. 2 [E3] HIGH PERFORMANCE COMPUTING**

**Course Outcomes:**

At the end of the course, the candidate will be able to

1. To Study various computing technology architecture.
2. To know Emerging trends in computing technology.
3. To highlight the advantage of deploying computing technology.
4. demonstrate understanding of learned concepts of parallel algorithm design, performance evaluation, communication operators by writing algorithms and programs exploiting parallel architecture
5. analyze the efficiency of parallel algorithms designed for matrix, graph and sorting operations

**Subject and code: PH 602.2 E1: SOFTWARE ENGINEERING and UML**

**Course Outcomes:**

1. Plan and deliver an effective software engineering process, based on development lifecycle models.
2. Employ group working skills including general organization, planning and time management and negotiation.
3. Apply software engineering principles and techniques.
4. Understand the principles of large scale software systems, and the processes that are used to build them
5. Analyze a problem, and identify and define the computing requirements appropriate to its solution.
6. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

**Subject and code: PH 602.2 E2: OBJECT ORIENTED SOFTWARE ENGINEERING**

**Course Outcomes:**

1. Display understanding and the ability to apply object-oriented programming principles.
2. Have detailed knowledge of the software development lifecycle.
3. Apply skills relevant for academic progression and career development within the sector.
4. Explore and analyze different analysis and design models, such as OO Models, Structured Analysis and Design Models, etc.
5. Show an ability to use the graphical UML representation using tools.
6. Apply software engineering perspective through software design and construction, requirements analysis, verification, and validation, to develop solutions to modern problems such as security, data science, and systems engineering.

**Subject and code: PH 602.2 E3: AGILE SOFTWARE DEVELOPMENT**

**Course Outcomes:**

<ol style="list-style-type: none"> <li>1. Understand concept of agile software engineering and its advantages in software development.</li> <li>2. Recognize various agile methods.</li> <li>3. Understand the principles behind the agile approach to software development</li> <li>4. Deconstruct user stories into tasks and ideal day estimates.</li> <li>5. Differentiate between the testing role in agile projects compared with the role of testers in non-agile projects.</li> </ol>
<b>Subject and code: PH 603.2 (E1): Mobile Application Development using Android</b>
<b>Course Outcomes:</b>
<ol style="list-style-type: none"> <li>1. Understand the architecture, working and environmental setup of Android</li> <li>2. Design and Implement simple GUI based Android Apps that handle user input and provide information</li> <li>3. Implement Android apps that are able to receive broadcasted messages, act as content provider or receiver and run background services.</li> <li>4. Create Android Apps that can manipulate data from various data stores such as internal, external memory and also SQLite as a Database.</li> <li>5. Design and Work with advanced sensors of the phone and manipulate Telephony and SMS in an Android Phone.</li> </ol>
<b>Subject and code: PH 603.2 (E2): Cross Mobile App Development using React Native</b>
<b>Course Outcomes:</b>
<ol style="list-style-type: none"> <li>1. Write JavaScript code for any particular scenario and also be familiar with the syntax of JavaScript</li> <li>2. Create simple React JS based User Interfaces and UI Components</li> <li>3. Create React Native apps that simultaneously work in Android and iOS</li> <li>4. To Use Widgets and components to create professional mobile applications</li> <li>5. To Create Cross Platform apps that makes use of all the advanced features that React Native has to offer.</li> </ol>
<b>Subject and code: PH 603.2 (E3): Mobile App Development for iOS with Swift</b>
<b>Course Outcomes:</b>
<ol style="list-style-type: none"> <li>1. Understand the working of mobile devices compared to the various architectures available</li> <li>2. Do programming with the Swift Language</li> <li>3. Use advanced concepts of Swift to solve complex problems</li> <li>4. Use Widgets and components to create professional iOS applications</li> <li>5. Develop iOS apps to perform the various advanced tasks like Database handling.</li> </ol>
<b>Subject and code: PH 604.2 P Cloud Computing and Mobile App Development Lab</b>
<b>Course Outcomes:</b>
<p>Course Outcome : At the completion of this unit, students will:</p> <ul style="list-style-type: none"> <li>• Understand the business models that underlie Cloud Computing</li> <li>• Understand the importance of protocols and standards in computing.</li> <li>• Understand the issues involved in distributed computing</li> <li>• Ability to deploy applications using the Unicorn Grid middleware</li> <li>• Ability to programme using the APIs of Cloud Computing</li> <li>• Ability to create Virtual Machine images and to deploy them on a Cloud.</li> </ul>
<b>Subject and code: PS 605.2 [E1]: NATURAL LANGUAGE PROCESSING</b>
<b>Course Outcomes:</b>

1. Understand natural language processing and to learn how to apply basic algorithms in this field.
2. Understand POS tagging and context free grammar for English language
3. Learn how model linguistic phenomena with formal grammars; and to design, implement and test algorithms for NLP problems
4. Understand the mathematical and linguistic foundations underlying approaches to the various areas in NLP
5. Apply NLP techniques to design real world NLP applications such as machine translation, text categorization, text summarization, information extraction

**Subject and code: PS 605.2 [E2]: IMAGE PROCESSING AND PATTERN RECOGNITION**

**Course Outcomes:**

1. Understand image formation, role of human visual system plays in perception of gray and color image data.
2. Apply image processing techniques in both the spatial and frequency (Fourier) domains. Apply different de-noising models to recover original image.
3. Design image analysis techniques, image segmentation and to evaluate the Methodologies for segmentation. Conduct independent study and analysis of feature extraction techniques.
4. Identify different pattern recognition techniques and apply them in real world problems.
5. Learn how to classify patterns. And build a statistical classifier and will learn how to use other classifiers.
6. Be able to write programs in Matlab language for digital manipulation of images; image acquisition; preprocessing; segmentation; Fourier domain processing.

**Subject and code: PS 605.2 [E3] : Bioinformatics Algorithms, Databases and Tools**

**Course Outcomes:**

1. Gain a knowledge of simple biology and Bioinformatics
2. Gain knowledge of database and tools with respect to Genomics and Proteomics; usage of different biological databases for understanding protein domains and families
3. Understand the algorithmic complexity of Biological algorithms; application of algorithms to find motifs in proteins
4. Usage of gene prediction algorithms and its statistical approaches
5. Usage of HMM for Profiling; applying graph algorithm for protein sequencing

**Subject and code: PS 606.2 [E1] : DATA WAREHOUSING AND DATA MINING**

**Course Outcomes:**

1. List the definitions, concepts and architectures of data warehousing and data mining
2. Demonstrate the impact of business reporting, information visualization and dashboards
3. Explain data mining, support vector machines and text mining.
4. Define social impacts of data mining.
5. Handle classification through statistical methods used in prediction.

**Subject and code: PS 606.2 [E2] : BUSINESS INTELLIGENCE & ADVANCED DATA MINING**

**Course Outcomes:**

1. Identify the major frameworks of business intelligence (BI).
2. List the definitions, concepts and architectures of data mining

3. Demonstrate the impact of business reporting, information visualization and dashboards
4. Handle classification through statistical methods used in prediction.
5. Explain data mining, neural networks, support vector machines, text mining, web mining and social network analysis.
<b>Subject and code:PS 606.2 [E3] : DATA SCIENCE AND ANALYTICS</b>
<b>Course Outcomes:</b>
1. Use data management techniques to store data
2. Use statistical methods and visualization to quickly explore data
3. Apply statistical and computational analysis to make predictions based on data
4. Implement data-intensive computations on cluster and cloud infrastructures.
5. Effectively communicate the outcome of data analysis using descriptive statistics and visualizations
<b>Subject and code: PS 607. 2 P Advanced Computing and Data Mining Lab</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• examine the concepts of data warehousing and OLAP;</li> <li>• apply the concepts of BI and DM techniques for clustering, association, and classification;</li> <li>• understand the operation procedures of BI projects in an organization;</li> <li>• select appropriate DM tools and methods to manipulate and achieve data;</li> <li>• apply DM concepts for formulating business strategies and programs to enhance business intelligence.</li> </ul>
<b>Subject and code: PH 608.2 : MINI PROJECT AND ADVANCED ENTREPRENURESHIP</b>
<b>Course Outcomes:</b>
<p>Research output with philosophical base and greater relevance to the society</p> <ul style="list-style-type: none"> <li>• Quality research with scientific methodology</li> <li>• Production of good Research Reports</li> <li>• Original Research following ethical guidelines and practices in conducting the research and publication of papers.</li> <li>• More awareness on Intellectual property Rights and Patents.</li> </ul>
<b>Semester-III</b>
<b>Subject and code: PH 601.3 [E1] : FUNCTIONAL PROGRAMMING PARADIGM</b>
<b>Course Outcomes:</b>
1. Understand the basic fundamentals data types, and function structure required for Haskell programming language.
2. Implementation of functions, loops, arrays, objects, and working with JSON data.
3. Implementation of files, I/O and Buffering.
4. Understand the basic fundamentals object-oriented, Scalars, Collections and functions required for Clojure programming language.
5. Implementation of vectors, list, queues and function for Clojure programming language.
<b>Subject and code: PH 601.3 [E2] : INTERNET OF THINGS AND APPLICATIONS DEVELOPMENT</b>
<b>Course Outcomes:</b>
1. Understand the basic networking model, internet/Web, networking equipment required for design of IoT.

2. Understand the basic IoT protocols, architecture, reference architecture, data representation, required for design of IoT.
3. Understand the basic of data link layer protocols and their feature for the design of IoT.
4. Understand the basic of user experience in design of IoT and multipurpose computer concepts, sensor for IoT design.
5. Understand the basic of networking, issues, challenges, communication patterns for the IoT design.
<b>Subject and code: PH 601.3 [E3] : AUGMENTED AND VIRTUAL REALITY</b>
<b>Course Outcomes:</b>
1. Understand the basic fundamental topics to consider for the design of Augment and Virtual Reality.
2. Understand the Software and Hardware needed for Augment and Virtual Reality.
3. Knowledge on fundamentals of Wearable Computers, scope, augmented Reality and their challenges.
4. Knowledge on fundaments of Input, Output interface required for the design of Virtual Reality.
5. Knowledge on fundaments of technology, features and visualization techniques required for design of Augment Reality.
<b>Subject and code:PH 602.3 [E1] WEB DEVELOPMENT WITH ANGULAR .JS, NODE .JS</b>
<b>Course Outcomes:</b>
At the end of the course, students should be able to:
1. Get introduced in the area of JavaScript's Role in recent web applications.
2. Acquire knowledge about client side java framework angularJs
3. Acquire knowledge about Building Applications using Angular JS.
4. Acquire knowledge about server side framework nodeJS
<b>Subject and code: PH 602.5 [E2] CONTENT MANAGEMENT WITH JOOMLA &amp; WORDPRES</b>
<b>Course Outcomes:</b>
At the end of the course, students should be able to:
• Create and deploy websites using CMS, including creating and editing content, adding functionality, and creating custom templates and themes.
• Understand ongoing maintenance considerations with CMS websites.
<b>Subject and code: PH 602.3 [E3] Blockchain Technology with Ethereum</b>
<b>Total No. of Le</b>
<b>Course Outcomes:</b>
1. Understand what and why of Blockchain
2. Explore the major components of Blockchain
3. Learn about Hyperledger Fabric model and its Architecture
4. Learn about Hyperledger Composer and Explorer
5. Learn about Bitcoin, Ethereum
6. Learn about Ethereum Virtual machine, The Ethereum network. Applications developement on Ethereum.
<b>Subject and code: PH 603.3 (E1) Computing with C# and .NET Framework</b>
<b>Course Outcomes:</b>
At the end of the course, students should be able to:
1. Understand what is .NET Framework and how does it work
2. Develop Programs using various C# concepts

3. Design and develop full-fledged UWP applications using C#
4. Use any DB technology and create a dynamic UWP.
5. Gain knowledge in the area of .NET Core and develop applications using .NET Core
<b>Subject and code: PH 603.3 (E2): Web Technologies and .NET Framework</b>
<b>Course Outcomes:</b>
<ol style="list-style-type: none"> <li>1. Understand what is .NET Framework and Develop Programs using various C# concepts</li> <li>2. design and develop full-fledged Web applications using ASP.NET With C#</li> <li>3. Use any DB technology such as ADO.NET, LINQ or EF to create a Dynamic application.</li> <li>4. Create and Consume Web Services and Develop ASP.NET MVC based applications; Use AJAX</li> <li>5. Develop web applications using ASP.NET Core</li> </ol>
<b>Subject and code: PH 603.3 (E3) Cross Platform Development using .NET Cor</b>
<b>Course Outcomes:</b>
At the end of the course, students should be able to:
<ol style="list-style-type: none"> <li>1. Understand what is .NET Framework and Develop Programs using various C# concepts</li> <li>2. Design and develop full-fledged applications using .NET Core</li> <li>3. Use DB technologies like Entity Framework and LINQ with .NET Core</li> <li>4. Create and Deploy Web Applications using ASP.NET Core</li> <li>5. Develop Professional Websites using ASP.NET Core, ASP.NET MVC Core and Razor View Engine</li> </ol>
<b>Subject and code: PH 604.3 P Web Application Development &amp; .NET Lab</b>
<b>Course Outcomes:</b>
<ul style="list-style-type: none"> <li>• Identify important events and individuals in the history of human-computer interfaces.</li> <li>• Design and develop Windows application using different Windows technologies that use a variety of GUI controls and classes to fulfill specific user requirements.</li> <li>• Explain how event driven applications use threading to perform time-consuming operations.</li> <li>• Demonstrate how to use specific features of the C# programming language to write object-oriented programs and handle run-time errors.</li> <li>• Explain in a public presentation how user interfaces should be designed to accommodate human physiology and limitations.</li> </ul>
<b>Subject and code: PS 605.3 [E1]: Cognitive Computing and Artificial Intelligence</b>
<b>Course Outcomes:</b>
<ol style="list-style-type: none"> <li>1. Apply AI technique on current applications with cognitive psychology using connectionist approach</li> <li>2. To design applications using computational cognitive neuroscience by applying techniques of cognitive computing and neural network theory</li> <li>3. To Design intelligent agents for problem solving, reasoning and planning.</li> <li>4. To implement AI systems with different approaches of knowledge representation, design AI systems with heuristic search techniques</li> <li>5. To implement AI systems using statistical and symbolic reasoning, designing AI models using Bayes rule</li> </ol>
<b>Subject and code: PS 605.3 [E2] : Computational Intelligence and Machine Learning</b>

<b>Course Outcomes:</b>
<ol style="list-style-type: none"> <li>1. Gain a working knowledge of knowledge-based systems using neural networks</li> <li>2. Implement intelligent systems technologies with neural network and fuzzy logic</li> <li>3. Implement typical computational intelligence systems with various performance metrics and conducting the analysis</li> <li>4. To implement machine learning models using Bayesian algorithm; implement applications using k-means clustering.</li> <li>5. To implement machine learning models using decision trees &amp; LDA and analyze the results.</li> </ol>
<b>Subject and code: PS 605.3 [E3] Deep Learning and Neural Networks</b>
<b>Course Outcomes:</b>
<ol style="list-style-type: none"> <li>1. To implement a neural network for an application of your choice using an available tool</li> <li>2. To implement different memory network using programming language; develop applications using fuzzy logic.</li> <li>3. Apply fuzzy logic to many real world problems.</li> <li>4. To design and implement deep learning models using CNN and RNN</li> <li>5. To implement deep learning models using autoencoders and transfer learning</li> </ol>
<b>Subject and code: PS 606.3 [E1]: BIG DATA ANALYTICS with MAP REDUCE AND HADOOP</b>
<b>Course Outcomes:</b>
<ol style="list-style-type: none"> <li>1. Identify and distinguish big data analytics applications from other applications and the use of Big Data.</li> <li>2. Describe No SQL databases and understanding different concepts related to No SQL and its applications using MongoDB.</li> <li>3. Understanding Hadoop and its advantage over the traditional database applications in solving practical problems</li> <li>4. Writing programs using mapper and reducer.</li> <li>5. Using Hive and Pig for analyzing and querying data and knowing the advantages over the traditional Data handling solutions.</li> </ol>
<b>Subject and code:PS 606.3 [E2]: BIG DATA ANALYTICS WITH SCALA AND SPARK</b>
<b>Course Outcomes:</b>
<ol style="list-style-type: none"> <li>1. Understand what Functional programming is and will know why classical data analysis techniques are no longer adequate</li> <li>2. Understand the benefits that Spark and Spark SQL offers for processing structured and unstructured data.</li> <li>3. Understand conceptually how Spark SQL is used for Data Exploration, Data Munging and Data Streaming.</li> <li>4. Understand how Spark can be used for Machine Learning.</li> <li>5. Understand the use of PySpark and Sparkr</li> </ol>
<b>Subject and code: PS 606.3 [E3] : BIG DATA VISUALIZATION USING TABLEAU</b>
<b>Course Outcomes:</b>
<p>Upon successful completion of this course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Knowing the impact of Data visualization techniques and how it helps to better understand the data Topics in information design, interaction design and user engagement.</li> <li>2. Understand and apply the fundamental concepts and techniques in data visualization</li> </ol>

3. Solve specific real-world problems related to the visualization and interpretation of data analysis results using charts and maps.
4. Getting to know Tableau public and using its various features.
5. Working with different real time examples and understanding the impact of visualization in real life situations.
<b>Subject and code: PS 607. 3 P Machine Learning &amp; Big Data Lab</b>
<b>Course Outcomes:</b>
Upon completion of the subject, students will be able to <ul style="list-style-type: none"> <li>• examine the concepts of data warehousing and OLAP;</li> <li>• apply the concepts of BI and DM techniques for clustering, association, and classification;</li> <li>• understand the operation procedures of BI projects in an organization;</li> <li>• select appropriate DM tools and methods to manipulate and achieve data;</li> <li>• apply DM concepts for formulating business strategies and programs to enhance business intelligence.</li> </ul>
<b>Subject and code: PH 608.3 BUSINESS CONSULTANCY PROJECT</b>
<b>Course Outcomes:</b>
for the student to demonstrate: <ul style="list-style-type: none"> <li>• Considerably more in-depth knowledge of the major subject/field of study, including deeper insight into current research and development work.</li> <li>• Concepts to address specific management needs at the individual, team, division and/or organizational level</li> <li>• Practical applications of project management to formulate strategies allowing organizations to achieve strategic goals</li> <li>• A perspective of leadership effectiveness in organizations</li> <li>• Team-building skills required to support successful performance</li> <li>• Critical-thinking and analytical decision-making capabilities to investigate complex business problems to propose project-based solutions</li> <li>• Skills to manage creative teams and project processes effectively and efficiently</li> </ul>
<b>Subject and code: PA 609.3 SEMINAR AND TECHNICAL COMMUNICATION - II</b>
<b>Course Outcomes:</b>
Gather, organize, summarize and interpret literature with the purpose of formulating a proposal.
☐ Write a technical report summarizing state-of-the-art on an identified topic.
☐ Present the study using graphics and multimedia techniques.
☐ Define intended future work based on the technical review.
<b>Semester-IV</b>
<b>Subject and code: PH 601.6 : INDUSTRY INTERNSHIP / PROJECT WORK</b>
<b>Course Outcomes:</b>
CO 1 Gather,organize,summarizeandinterpretliteraturewiththepurposeofformulatinga Research problem and working on it to propose a solution.
CO 2 Writeatechnical papersummarizingstate-of-the-artonanidentifiedtopic.
CO 3 Presentthestudyusinggraphicsandmultimediatechniques.
CO 4 Defineintendedfutureworkbasedonthetechnicalreview.
CO 5 Publish the work in a reputed Journal of interest or present it in an international/national State/Regional conferences.

<b>Department Name:</b>	<b>P 800 M.Sc. (Big Data Analytics)</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PEO1 To practice big data analytics and machine learning approaches, which include the study of modern computing using big data technologies and machine learning techniques focusing on industry applications.</p> <p>PEO2 To develop Numerical and Statistical skills that will play an important role in their Job role as data Scientist / data analytics in analyzing the problem at hand and give the appropriate and efficient solution.</p> <p>PEO3 Apply the concepts of Analytics to the real world problems by converting datasets to models in order to make better business decisions.</p> <p>PEO4 Apply the skills gained in the course to improve the research which would have a great impact on the societal development by emphasizing on how data can be collected and used in ethical and socially sensitive ways.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>Program Outcomes</p> <p>PO1 Statistical computing: Ability to understand the basic concepts of how to explore the datasets using statistical analysis techniques in Python and R.</p> <p>PO2 Mathematical Skills: Ability to understand and implement various algorithms which require strong hold on the mathematical skills</p> <p>PO3 Database management: Ability to Execute queries, implement views and joins, use MongoDB for various operations on unstructured data. Ability to Optimize business decisions and create competitive advantage with Big Data analytics and understand architectural concepts of Hadoop and map reduce paradigm</p> <p>PO4 Implementation using various software: This enables the students to develop strong programming skills required to handle complex data and build algorithms that will provide efficient solutions to the problem at hand.</p> <p>PO5 Machine learning: Understand a wide variety of learning algorithm, how to evaluate models generated from data and apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.</p> <p>PO6 Enabling technologies: Learn about the relationship between data science and natural language and audio-visual content processing</p> <p>PO7 Natural language processing: Understand approaches to syntax, semantics in NLP, to discourse, generation, dialogue and summarization within NLP and Understand current methods for statistical approaches to machine translation.</p> <p>PO8 Value thinking:</p>	

Recognize important ethical issues that arise in various business contexts and professional practice; To Demonstrate an understanding of the ethical, social and economic environments in which those occur.

PO9 Advanced Statistical Analysis:

Mastering of a suite of methods and workflow styles that will enable the student to produce several new statistical analysis correctly and efficiently present the results from those analyses.

PO10 Societal development:

Identify the information security models and their characteristics, by analysing the different types of cryptographic and forensic methods. Identify and solve different cyber security threats that hamper the society.

PO11 Application of Skills:

Provide the knowledge and necessary skills to accomplish various analytics with respect to areas like health, HR, Travel, ... so that they are able to provide efficient analysis and interpretation.

**Subject and code:** PH 801.1: STATISTICAL METHODS

**Course Outcomes:**

CO 1 To design appropriate instruments to collect data effectively.

CO 2 To provide effective data visualization that will provide new insights from the data.

CO 3 To Organize, manage and present data effectively.

CO 4 To analyze statistical data graphically using frequency distributions.

CO 5 To Construct and interpret Contingency Tables

**Subject and code:** PH 802.1: PROBABILITY & STOCHASTIC PROCESS

**Course Outcomes:**

CO 1 To calculate the probabilities and identify the various types.

CO 2 To express the features of discrete random variables and formulate the distribution functions.

CO 3 To express the features of continuous random variables and formulate the distribution functions

CO 4 To Classify a stochastic process according to whether it operates in continuous or discrete time and whether it has a continuous or a discrete state space. To Understand the concept of Markov chains and study the transition diagram.

CO 5 To apply the concept of stationarity to the analysis of time series data in various contexts

**Subject and code:** PH 803.1: LINEAR ALGEBRA & LINEAR PROGRAMMING

**Course Outcomes:**

CO 1 Understand the basic concepts of linear Algebra

CO 2 Understand the concept of Random Numbers and its properties.

CO 3 Understand the principles of solving a set of linear equations,

CO 4 Familiarize with the methods involved in solving a set of linear equations.

CO 5 To model a problem as a linear programming problem

CO 6 Use the simplex method to solve small linear programming models by hand, given a basic feasible point.

**Subject and code:** PH 804.1P: COMPUTING FOR DATA SCIENCES LAB

**Course Outcomes:**

CO 1 To perform data analysis using the appropriate techniques.

CO 2 To know how convergence, takes place and use the appropriate methods.
CO 3 To generate random numbers and understand how a system can be simulated using them.
<b>Subject and code: PS 805.1: DATABASE MANAGEMENT SYSTEM</b>
<b>Course Outcomes:</b>
CO 1 Draw an ER Diagram for a given system by analysing the requirements
CO 2 Normalize the tables atleast to 3N form and perform various operations on tables that are thus created
CO 3 Appreciate and apply Graph database
CO 4 Execute queries, implement views and joins, use MongoDB for various operations on unstructured data
CO 5 Work with Hadoop Ecosystem and also implement database security in SQL, NoSQL and Hadoop
<b>Subject and code: PS 806.1: PYTHON PROGRAMMING</b>
<b>Course Outcomes:</b>
CO 1 Choose the right data type or Collection module for any given set of data.
CO 2 Use conditional statements and loops to manipulate; Create, use & reuse functions created from python
CO 3 Open, Read and Write a File from Python and also to import and use various logical modules in python
CO 4 Handle any type of exceptions that might be raised from a typical program
CO 5 Create classes and objects to perform operations and also to perform CRUD Operations on a SQLite Database
<b>Subject and code: PS 807.1 P: DBMS &amp; PYTHON PROGRAMMING LAB</b>
<b>Course Outcomes:</b>
CO 1 Solve real world problems using python as a programming language
CO 2 Create applications that handle files and include various packages to solve complex issues
CO 3 Create a completely data driven application that includes exception handling and perform all database related operations.
CO 4 Create a table, Execute complex and nested queries, create views and joins and also execute cursors and triggers using Oracle SQL
CO 5 Use MongoDB to create Database, Collection, Document etc. and also understand Hadoop Ecosystem
<b>SEMESTER – II</b>
<b>Subject and code: PH 801.2: MACHINE LEARNING - I</b>
<b>Course Outcomes:</b>
CO 1 To implement machine learning models with linear regression
CO 2 To design applications using Logistic regression by using the methodology to avoid overfitting
CO 3 To design systems using Perceptron algorithm
CO 4 To implement machine learning systems using SVM
CO 5 To implement machine learning models using k-means clustering by applying dimensionality reduction and anomaly detection
<b>Subject and code: PH 802.2: ENABLING TECHNOLOGIES FOR DATA SCIENCE – I</b>
<b>Course Outcomes:</b>

CO 1 To understand data mining principles and will identify appropriate datamining algorithms to solve real-world problems. To understand the strength and weakness of algorithms.

CO 2 To design a data mart or data warehouse for any organization. To design data warehouse with dimensional modelling and apply OLAP operations.

CO 3 To learn methods in integrating and interpreting the data sets and improving effectiveness, efficiency and quality for data analysis.

CO 4 To predict categorical class labels (discrete or nominal) and classifies data (constructs a model) based on the training set and the values (class labels) in a classifying attribute and uses it in classifying new data and also predicts unknown or missing values.

CO 5 To identify clusters in multivariate data, apply normalization techniques, and correctly interpret the output of different clustering procedures. And to describe complex data types with respect to spatial and temporal data mining.

Electives (Choose 1)

**Subject and code: PH 803.2 (E1): OPERATIONS RESEARCH**

**Course Outcomes:**

CO 1 To Proficiently deal with the tools for optimization.

CO 2 To Develop an understanding of the foundation of classic continuous optimization problems and to identify the convexity, smoothness, feasible region and dual reformulation.

CO 3 To proficiently allocate scarce resources to optimize and maximize profit or minimize loss and facilitates the optimal method of allocating jobs to persons.

CO 4 To facilitate with mathematical and computational modeling of real decision-making problems.

CO 5 To construct and analyse priority queuing systems.

**Subject and code:PH 803.2 (E2): CLOUD COMPUTING**

**Course Outcomes:**

CO 1 After successfully completing the course the students will have an understanding of:

CO 2 Apply the fundamental concepts in data centers to understand the trade-offs in power, efficiency and cost.

CO 3 Discuss system virtualization and outline its role in enabling the cloud computing system model.

CO 4 Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems

CO 5 Illustrate the fundamental concepts of web services.

CO 6 Analyze various cloud programming models and apply them to solve problems on the cloud.

**Subject and code: PH 803.2 (E3): NATURAL LANGUAGE PROCESSING**

**Course Outcomes:**

CO 1 Analyse syntax, semantics, and pragmatics of NLP. Ability to develop simple N-gram models

CO 2 Perform POS tagging on simple English sentences using Hidden Markov model

CO 3 Develop grammars for some simple English sentences, ability to draw parse trees. Apply different parsing techniques

CO 4 Analyse syntactic, semantic and pragmatic ambiguities, learn to apply supervised and unsupervised word-sense disambiguation.

CO 5	Analyse different Machine translation approaches.
<b>Subject and code: PH 803.2 (E4): UNIX PROGRAMMING</b>	
<b>Course Outcomes:</b>	
CO 1	Students are able to know an overview of Unix operating system and uses of shell commands.
CO 2	Students will able to understand the concept of I-node and its use with applications of grep commands.
CO 3	Students get know about user and program interface with some system calls requirement and its applications.
CO 4	Students are able to know use of signaling and importance of Inter process communications.
CO 5	Students will understand the importance and application of inter-process communications
<b>Subject and code: PH 803.2(E5): OPERATING SYSTEMS</b>	
<b>Course Outcomes:</b>	
CO 1	Students are able to understand the basics of operating systems with need and working.
CO 2	Students will able understand the fundamentals of UNIX operating system with signals and system class.
CO 3	Students will able to understand fundamentals of concurrent process and concept of mutual exclusion and implementation of semaphores.
CO 4	Students are able to understand importance of Inter process communications resulting deadlocks which can be prevented or avoided with some algorithms.
CO 5	Students will understand the importance and benefits of virtual memory. The file structure of UNIX operating system.
<b>Subject and code: PH 803.2 (E6): MULTIVARIATE STATISTICS:</b>	
<b>Course Outcomes:</b>	
CO 1	To identify the most appropriate statistical techniques for a multivariate dataset and carry out and apply commonly used multivariate data analysis techniques, and interpret results
CO 2	To carry out a principal component's analysis Assess how many principal components are needed and Interpret principal component scores.
CO 3	To classify data using appropriate algorithms.
CO 4	To describe the difference between Factor Analysis (FA) and Principal Component Analysis (PCA) and will be able to extract factors that describe the data.
CO 5	To Create a document retrieval system using k-nearest neighbors. -Identify various similarity metrics for text data.
<b>Subject and code: PH 804.2P: MACHINE LEARNING AND DATA SCIENCE LAB - I</b>	
<b>Course Outcomes:</b>	
CO 1	Examine the concepts of data warehousing and OLAP;
CO 2	Apply the concepts of BI and DM techniques for clustering, association, and classification;
CO 3	Understand the operation procedures of BI projects in an organization;
CO 4	Select appropriate DM tools and methods to manipulate and achieve data;
CO 5	Apply DM concepts for formulating business strategies and programs to enhance business intelligence.
<b>Subject and code: PS 805.2: FOUNDATIONS OF DATA SCIENCE</b>	

<b>Course Outcomes:</b>
CO 1 Solve problems using basic graph theory CO 2 Applying various concepts relevant with high-dimensional data. CO 3 Understanding large structures, like the web and social networks, in building models. CO 4 Applying the use of singular value decomposition (SVD) for dimension reduction of high-dimensional data sets, and multi-dimensional scaling and its connection to principle component analysis. CO 5 Applying the concept of frequency moments of data streams and matrix algorithms in streaming model
<b>Subject and code: PS 806.2: ADVANCED STATISTICAL METHODS</b>
<b>Course Outcomes:</b>
CO 1 To estimate population parameters using point and interval estimates. CO 2 To recognize the logic behind a hypothesis test and how it relates to the P-value. CO 3 To know the theoretical foundation of applied linear modeling, starting with the univariate models and then with multivariate data CO 4 To apply multiple linear regression analysis, differentiate between simple linear regression analysis and multiple linear regression analysis and predict the model and interpret it. CO 5 To apply the functional form of the logistic model and how to interpret model coefficients.
<b>Subject and code: PS 807.2: VALUE THINKING</b>
<b>Course Outcomes:</b>
CO 1 Recognize important ethical issues that arise in various business contexts and professional practice; CO 2 Demonstrate an understanding of the ethical, social and economic environments in which those occur; CO 3 Demonstrate critical thinking skills required for the successful practice of management and the professions within the framework of societal values; CO 4 Demonstrate confidence in introducing ethical considerations into professional and managerial decision making and explaining their importance to others; and CO 5 Use their ethical imaginations in resolving dilemmas and enhancing business decision-making.
<b>Subject and code: PS 808.2P: PROGRAMMING FOR BIG DATA AND ADVANCED STATISTICAL METHODS LAB</b>
<b>Course Outcomes:</b>
CO 1 To perform machine learning techniques such as clustering and classification effectively. CO 2 To apply the concepts of BI and DM techniques for clustering, association, and classification; CO 3 To apply the graph theory algorithms to real data and analyze appropriately. CO 4 To use appropriate statistical testing criteria based on the problem. CO 5 To evaluate and apply ANOVA to the problem at hand. CO 6 To identify and apply appropriate regression models considering all the assumptions. CO 7 To perform binary output models using logistic regression.
<b>Subject and code: OE 809.2: STATISTICAL DATA ANALYSIS USING R</b>

<b>Course Outcomes:</b>
CO 1 Ability install R programming language on windows, Linux and Mac operating systems and able to program simple R programs.
CO 2 Ability to use inbuilt R functions to work on objects, matrix, vectors, data frames and tables.
CO 3 Ability to program summary and cumulative commands to apply it on tables and objects.
CO 4 Ability to use stem and leaf plot on the dataset, histograms to represent the data and ability to use shapiro-wilk test, Kolmogorov-Smirnov test etc.
CO 5 Ability to use students t-test, U-test, chi squared test montecarlo simulation and able apply these on different data sets.
<b>SEMESTER – III</b>
<b>Subject and code: PH 801.3: MACHINE LEARNING - II</b>
<b>Course Outcomes:</b>
CO 1 To implement classification models with decision tree and probabilistic classifiers; regression models with regression tree classifiers
CO 2 To implement predictive models using SVM and Perceptron with usage of loss functions and gradient descent
CO 3 To implement machine learning models with k-means clustering; models with collaborative filtering and implement EM algorithm
CO 4 To implement machine learning systems using Ensemble models and graphical models
CO 5 To implement models with genetic algorithm and working out gradient descent for large datasets
<b>Subject and code: PH 802.3: ENABLING TECHNOLOGIES FOR DATA SCIENCE - II</b>
<b>Course Outcomes:</b>
CO 1 Read data from persistent storage and load it into Apache Spark, - manipulate data with Spark
CO 2 Understand working of spark sessions, functions to manipulate and analyze data using Spark data frames
CO 3 Warehouse your data efficiently using Hive, Spark SQL and Spark Data Frames
CO 4 Manipulate data using Scala and write programs that effectively use parallel collections to achieve performance
CO 5 Recognize and apply design principles of functional programs
<b>Subject and code: PH 803.3 P: MACHINE LEARNING AND DATA SCIENCE LAB - I</b>
<b>Course Outcomes:</b>
CO 1 Demonstrate the knowledge of big data, data science, data analytics, distributed file systems, parallel Map Reduce paradigm, NoSQL, machine learning, etc.
CO 2 Program and implement examples of big data and NoSQL applications using open source Hadoop, HDFS, Spark, Scala, etc.
CO 3 Read current research papers and implement example research group project in big data.
<b>Subject and code: PS 804.3: DATA VISUALIZATION WITH TABLEAU &amp; MODELLING IN OPERATIONS MANAGEMENT</b>
<b>Course Outcomes:</b>
CO 1 Understand and apply the fundamental concepts and techniques in data visualization

CO 2	Design, develop, and evaluate effective visualizations and dashboards using various development tools
CO 3	Solve specific real-world problems related to the Visualization and interpretation of data analysis results
CO 4	Making use of patterns and insights in healthcare analytics
CO 5	Visualize the analyzed data pertaining to retail industry
<b>Subject and code: PS 805.3 (E1): INTRODUCTION TO ECONOMETRICS &amp; FINANCE</b>	
<b>Course Outcomes:</b>	
CO 1	To apply the above theories to empirical data or be able to develop new econometric theory
CO 2	To apply the generalized method of moments (GMM) estimation and interpret the results.
CO 3	To Use various economic models and methods to interpret and analyze real data in economics and finance.
CO 4	To test cointegration among times series data using appropriate tests.
CO 5	To perform Autoregressive conditional heteroscedasticity model and interpret the coefficients.
<b>Subject and code: PS 805.3 (E2): TIME SERIES ANALYSIS &amp; FORECASTING</b>	
<b>Course Outcomes:</b>	
co 1	<b>Know the basic time series structure and identify patterns.</b>
CO 2	<b>Define the concept of stationarity and describe its importance in time series analysis</b>
CO 3	<b>Test for non-stationarity that exists in the time series data by applying suitable tests.</b>
CO 4	<b>Model times series data and and use them efficiently to forecast.</b>
CO 5	<b>Identify and deal with the missing data values in time series data.</b>
<b>Subject and code: PS 805.3 (E3): BIOINFORMATICS</b>	
<b>Course Outcomes:</b>	
CO 1	Gain knowledge in using tools for implementing sequence alignment (BLAST, FASTA), MSA (ClustalW, T-Coffee etc), variants of BLAST
CO 2	To implement Gibbs sampling and genetic mapping using tools available
CO 3	Gain knowledge in using tools for implementing gene recognition and Transcriptomics
CO 4	Gain knowledge in using tools for implementing HMM, finding motifs
CO 5	Gain knowledge in using tools for implementing lattice models
<b>Subject and code: PS 805.3 (E4): BIG DATA TECHNOLOGIES AND ARCHITECTURE</b>	
<b>Course Outcomes:</b>	
CO 1	Identify the use of Hadoop for processing the data, configuring Hadoop cluster and exploring Hadoop distributed file system.
CO 2	Describe No SQL databases and understanding different concepts related to No SQL and its applications using Hive and Hbase.
CO 3	Writing map reduce programs using mapper and reducer.
CO 4	Writing map-reduce programs to perform K-Means clustering customizing partitioner and sort comparator.
CO 5	Learning the role of Inverted Index and usage of hadoop as a database.
<b>Subject and code: PS 806.3 (E1): INTELLECTUAL PROPERTY RIGHTS IPR</b>	
<b>Course Outcomes:</b>	

- CO 1 Understand and distinguish between different Intellectual properties and also identify the procedures to protect Intellectual property
- CO 2 Protect his own invention under patent and copyright specifically related to software. And also understand how one can derive revenue from protection of patents/copyrights
- CO 3 Identify the importance of industrial design and its protection
- CO 4 Recognizes the importance of different types of digital contracts and also finds mechanisms to protect digital documents
- CO 5 Identify different types of cybercrimes and also will understand what are the remedies available under cyber law in the case of such unlawful activities

**Subject and code:PS 806.3 (E2): CYBER SECURITY**

**Course Outcomes:**

- CO 1 Understand the basics of security attacks and threat model
- CO 2 Appreciate the vulnerabilities and threats posed by criminals, terrorist and nation states to national infrastructure
- CO 3 Have a strong understanding of different cryptographic protocols and techniques and be able to use them.
- CO 4 Apply methods for authentication, access control, intrusion detection and prevention.
- CO 5 Identify and mitigate software security vulnerabilities in existing systems

**Subject and code: PS 806.3 (E3): TEXT MINING**

**Course Outcomes:**

- CO 1 Ability to analyse structured, unstructured and semi-structured data. Understand about user experience of information seeking behaviour.
- CO 2 Ability to analyse linguistic foundations, and various approaches to text mining.
- CO 3 To analyse various text types, document formats and conversion, character encodings. Perform parts-of-speech tagging for simple English sentences.
- CO 4 To distinguish few tasks of text extraction – keyword extraction, named entity recognition. Perform simple extraction from small text.
- CO 5 To understand computational grammars, design and construction.

**Subject and code: PS 806.3 (E4): ADVANCED ANALYTICS**

**Course Outcomes:**

- CO 1 Understand why IoT is used and how it is implemented and how networks and communication is used to implement IoT
- CO 2 Understand how identity management models are used in IoT, also understand why trust management is important for IoT environment
- CO 3 Understand the use of protocols which are used in different layers and how it is combined with other protocols down the layers to carry out the communication
- CO 4 Understand how data is stored in cloud and how it is represented using different application to carry out or execute different data analytics tools
- CO 5 Understand the concepts of data science for IoT analytics, how to organize data for analytics, and how to get benefits from IoT analytical tools.

**Subject and code: PS 807.3 P: DATA VISUALIZATION WITH TABLEAU & OPERATION MANAGEMENT LAB**

**Course Outcomes:**

- CO 1 Understand and apply the fundamental concepts and techniques in data visualization

CO 2	Design, develop, and evaluate effective visualizations and dashboards using various development tools
CO 3	Solve specific real-world problems related to the Visualization and interpretation of data analysis results
CO 4	Making use of patterns and insights in healthcare analytics
CO 5	Visualize the analyzed data pertaining to retail industry
<b>Subject and code: PS 808.3: LAB ON ELECTIVES 1 &amp; 2</b>	
<b>Course Outcomes:</b>	
CO 1	Model times series data and use them efficiently to forecast.
CO 2	Use various models/ algorithms to gain information from the data and use it for better decision making
CO 3	Architect multiple real life use cases
CO 4	Apply the concepts of data science for IoT analytics, how to organize data for analytics, and how to get benefits from IoT analytical tools.
CO 5	Analyze various text types, document formats and conversion, character encodings. Perform parts-of-speech tagging for simple English sentences
<b>Subject and code: OE 809.3: BIG DATA &amp; DESIGN THINKING</b>	
<b>Course Outcomes:</b>	
CO 1	Develop viable solutions to user challenges using the design thinking and hypothesis-driven innovation processes.
CO 2	Gain user empathy through observation and interviewing, and develop user insights to identify unmet needs.
CO 3	Use multiple brainstorming techniques to find innovative solutions.
CO 4	Prototype a solution to a user challenge.
CO 5	Develop and test a business model or business case to support the viability of the solution.
<b>SEMESTER – IV</b>	
<b>Subject and code: PH 801.4: INDUSTRY INTERNSHIP / PROJECT WORK / DISSERTATION</b>	
<b>Course Outcomes:</b>	
CO 1	Provide a structure that will enable students to make connections between what they learn in the classroom and on the job, to further develop analytical and interpersonal skills, and to practice business writing skills.
CO 2	Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration.
CO 3	Ability to recognize and implement various ways of selecting suitable model parameters for different machine learning techniques.
CO 4	Ability to integrate machine learning libraries and mathematical and statistical tools with modern technologies like Hadoop and map reduce.
<b>Subject and code: PS 802.4: DOMAIN KNOWLEDGE PROJECT</b>	
<b>Course Outcomes:</b>	
CO 1	Help the students to work on a specific research area by identifying the research gaps and building their topic.
CO 2	Help the students to know the complete process of model building and apply the same based on the area of study.
CO 3	Build the confidence to work on any project by considering all the aspects of research questions that needs to be addressed.

- CO 4 Develop the capability of the students to Create, Analyze and critically evaluate different analytical solutions.
- CO 5 Holistic approach to a problem-solving ability will be well developed

**Department Name:** P 810 M.Sc. (Food Science, Nutrition and Dietetics)

**PROGRAMME OUTCOMES**

PO 1: Scientific Knowledge: Knowledge on the fundamentals of food science and nutrition, food chemistry and biochemical changes during processing and preservation, nutraceuticals, also students will be able to understand and apply sensory evaluation of food.

PO 2: Design/development of solutions: Design solutions for complex food engineering problems or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. Students will also develop an ability to work in modern tools and equipment's to analyze food composition, identify microorganism responsible for food spoilage.

PO 3: Problem analysis: Understand the principles behind analytical techniques used in evaluating the biochemical properties of food; they will be able to identify the microorganism responsible for food spoilage and the methods to control the food spoilage.

PO 4: Modern tool usage: Demonstrate knowledge in various engineering properties of food and its application in food industry, concept of mass balance and energy balance, unit operations in food processing, conventional and advanced methods of food preservation, methods of packing, post-harvest practices so as to develop food products and develop device for food industry.

PO 5: Skill development and application: Develop specific skill based on their interest in bakery and confectionery, meat, poultry and fish processing, food fermentation, dairy processing. Students will also be able to apply the principles of Hazard Analysis and Critical Control Points (HACCP) to ensure safe food processing, Students will also have knowledge in regulations governing the manufacture and sales of the food products.

PO 6: Research capabilities and Project management: Demonstrate the ability to apply knowledge through critical thinking, inquiry, analysis, and communication to produce scholarly and creative works in the form of an original oral scientific presentation, master's thesis/report, scientific manuscript for wide publication; participate as a member and leader in a team in order to manage multidisciplinary projects.

PO 7: Ethics: Demonstrate awareness of their responsibilities (professional integrity, ethical behavior, etc.) and commit to the highest standards of academic and professional integrity and ethical values.

PO 8: Environment and sustainability: Comprehend the impact food technologies and food waste processing solutions in societal and environmental contexts and promulgate the knowledge to strategize various approaches for sustainable development.

PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings which are basic qualities for a Food technologist.

PO 10: Interpersonal Skills: Listening and effective speaking on food science problem with the small, medium and large-scale food business operators and with the society at large. For instance, ability to comprehend and published effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: Life-long learning: Identify the need for and be prepared to engage in independent and life-long learning in the most extensive context of methods and technological advancement in the field of food science and technology.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO 1: To inculcate technical writing and communicating ability for effective documentation and presentations and develop strong research aptitude through research work to enable the students to opt for higher levels of learning in the field of Food science and Technology.

PSO 2: To acquaint and equip students with professional and intellectual integrity, ethics of research and scholarship, impact of research outcomes on professional practices and responsibilities to contribute positively in the sustainable development of society.

PSO 3: To enable the students to get engaged in lifelong learning independently with the vigor and zeal and become capable to start-up their own businesses.

#### **Subject and code: PH 811.1 Food Chemistry**

##### **Course Outcomes:**

- To study the relationships between the structure and functional properties of food molecules
- To study chemical processes and interactions of all biological and non-biological components of food
- To understand physico-chemical parameters in food

#### **Subject and code: PH 812.1 Principles of Food Processing and Preservation**

##### **Course Outcomes:**

- ☐ To understand the source and variability of raw food material and their impact on food processing operations.
- ☐ To understand the physical, chemical and biological processes involved in conversion of raw materials into finished food products.
- ☐ To study the principles and current practices of different processing techniques and its effects on process parameters and product quality.
- ☐ To study the spoilage and deterioration mechanisms in foods and its preventive measures.

#### **Subject and code: PH 813.1 Human Nutrition**

##### **Course Outcomes:**

- Course learning outcome:
- The role of macronutrients in growth and development
- To evaluate the methodology and derivation of requirements for specific macronutrients.
- The metabolic functions of macronutrient and their role in health and disease
- The implications of deficiency and toxicity of macronutrients

#### **Subject and code: PS 816.1 Human Physiology**

##### **Course Outcomes:**

Course learning outcome:

- ☐ Postgraduates should be able to understand the molecular biology of the cell.
- ☐ Students should be able to understand and recognize the role, physiology and anatomy of all the systems in the body

?	Students should be able to understand and acquaint with the diseases related to the malfunctioning of the organ systems.
<b>Subject and code: PS 817.1</b>	<b>Essentials of Micronutrients</b>
<b>Course Outcomes:</b>	
Course learning outcome:	<ul style="list-style-type: none"> <li>To understand the intricacies of each micronutrients in growth and development of humans</li> <li>To understand the basis of human nutritional requirement and recommendations through the life cycle</li> <li>To analyse the nutrient – nutrient and nutrients – drug interaction. Students will be familiar with factors affecting for the absorption of nutrients</li> <li>To understand the implications of deficiency and toxicity of micronutrients and to assess their status in the body</li> </ul>
<b>Subject and code: PS 818.1</b>	<b>Food Product Development</b>
<b>Course Outcomes:</b>	
Objectives:	
?	To study the consumer food preferences and choices
?	To enhance the knowledge base for product development
?	To study the sensory evaluation of foods and to understand basics statistics
<b>Semester-II</b>	
<b>Subject and code:PH 811.2</b>	<b>Clinical and Therapeutic Nutrition</b>
<b>Course Outcomes:</b>	
Course learning outcome:	
?	Students will be able to intervene the metabolic anomalies of acute and chronic diseases
?	They are able to demonstrate counselling techniques to facilitate behaviour change
?	They will get knowledge to plan menu for various diseases based on their nutritional status and dietary needs
?	The students will know the importance of a dietician in hospitals.
?	The students will be able to know the feeding therapy's to be flowed in hospitalized/ critically ill patients
<b>Subject and code: PH 812.2</b>	<b>Dietetics</b>
<b>Course Outcomes:</b>	
Course learning outcome:	
?	Students will have the knowledge of pathophysiology and causes, symptoms, risk factors and dietary management of different disease conditions and disorders
?	Students will have a thorough understanding the responsible of an dietician with respect to different disease
?	The students will be able know nutrition support systems during emergency.
?	Students able to understand principles of diet therapy, modification of normal diet for therapeutic purposes
?	Students will be able to interpret and apply nutrition concepts to evaluate and improve the nutritional health of individuals with medical conditions
<b>Subject and code: PS 815.2</b>	<b>RESEARCH METHODOLOGY AND ETHICS</b>

<b>Course Outcomes:</b>	
Course learning outcome:	
☐	Demonstrate knowledge of research processes (reading, evaluating, and developing)
☐	Perform literature reviews using print and online databases
☐	Define and develop a possible hied research interest area using specific research designs
☐	Compare and contrast quantitative and qualitative research paradigms, and explain the use of each in research
☐	Describe sampling methods, measurement scales and instruments, and appropriate uses of each
☐	Explain the rationale for research ethics, and the importance of IPR
<b>Subject and code: PS 816.2</b>	<b>Nutrition through Life Cycle</b>
<b>Course Outcomes:</b>	
Course learning outcome:	
☐	Determine nutrient requirements/needs of individuals at different stages of life
☐	Discuss the major nutrition related concerns at each stage of life.
☐	Understand the nutritional needs during pregnancy and lactation, physiological changes and hormones involved during pregnancy and lactation
☐	Understand the effects of ageing and life expectancy
<b>Subject and code: PS 817.2</b>	<b>Nutrition and Physical Fitness</b>
<b>Course Outcomes:</b>	
To know the basics of health, nutrition and wellbeing	
☐	To understand the concepts of diet and physical fitness
☐	To Emphasize the importance of proper fueling for physical activity, pre and post-workout
☐	To learn the special dietary modifications of sports nutrition
<b>Subject and code:PO 818.2</b>	<b>Basic Nutrition</b>
<b>Course Outcomes:</b>	
Course learning outcome:	
☐	Understand the functions and sources of nutrients, role of nutrients in maintenance of good health
☐	Understand the role of macro and micro nutrients in the growth and development
☐	Obtain the knowledge on role and importance of nutrition in weight management
☐	Gain knowledge about food pyramid, food guide, menu planning and balanced diet
<b>Semester-III</b>	
<b>Subject and code: PH 811.3</b>	<b>Food Microbiology</b>
<b>Course Outcomes:</b>	
Course learning outcome:	
☐	learn the fundamentals of food microbiology.
☐	Identify the novel methods for detection of immunological components.
☐	Acquire the knowledge on various criteria for microbiological assessments in various food products.
<b>Subject and code: PH 812.3</b>	<b>Nutraceuticals and Functional Foods in Human Health</b>
<b>Course Outcomes:</b>	

Course learning outcome:	
☐	Acquire knowledge on various bio molecules showing health benefits.
☐	Understand various physiological and biochemical aspects of life threatening and chronic diseases.
☐	Apply their knowledge regarding extraction, isolation, characterization and application of nutraceuticals in food industries.
☐	Identify various aspects about safety, quality and toxicology of food products including, nutraceutical and functional foods.
<b>Subject and code: PO 815.3</b>	<b>Health and Fitness</b>
<b>Course Outcomes:</b>	
Course learning outcome:	
☐	To know the role and importance of nutrition management in exercise and sport performance
☐	To emphasize the importance of proper fueling for physical activity, pre and post-workout
☐	To understand the concepts of diet and physical fitness
<b>Semester-IV</b>	
<b>Subject and code: PH 811.4</b>	<b>Nutritional Biochemistry</b>
<b>Course Outcomes:</b>	
Course learning outcome:	
☐	To describe the concepts and chemistry of major nutrients
☐	To explain the macronutrient metabolism and its bioenergetics
☐	To describe protein synthesis and nucleic acid metabolism
☐	To gain basic knowledge on the synthesis and role of hormones
☐	Understand the biological processes and systems as applicable to human nutrition.
<b>Subject and code: PH 812.4</b>	<b>Community Nutrition</b>
<b>Course Outcomes:</b>	
Course learning outcome:	
☐	The students will be able to assess the health status of the community
☐	Students Will know the various organizations related with food and nutrition with its functions
☐	They are able to provide nutrition counselling and education to individuals, groups, and communities throughout the lifespan using a variety of communication strategies
<b>Subject and code: PH813.4</b>	<b>Sports Nutrition</b>
<b>Course Outcomes:</b>	
Course learning outcome:	
☐	Understand the characteristics, physiology and body composition
☐	Obtain knowledge on role and importance of nutrition management in exercise and sport performance
☐	Be familiar with the macro and micronutrient needs of athletes
☐	Understand the role of nutrition in recovery from injury
<b>Subject and code: PS 815.4</b>	<b>Food Safety and Quality Control</b>
<b>Course Outcomes:</b>	
Course learning outcome:	
☐	Understand, use and apply the knowledge, skills of quality management in food processing.

?	Understand and critically evaluate the presence of contaminants in food quality assurance.
?	Understand the chemical, technological and toxicological aspects of food additives in food preservation.
?	Understand the concept of food safety, types of hazards and their control measures
?	Comprehend the need of hygiene and sanitation for ensuring food safety
<b>Subject and code: PS 816.4</b>	
<b>Assessment of Nutritional Status</b>	
<b>Course Outcomes:</b>	
<ul style="list-style-type: none"> <li>• To learn the direct and indirection methods of assessment</li> <li>• To understand food and nutrition security adding light to its systems</li> <li>• To study nutrition through life span and age specific nutritional requirements</li> </ul>	

<b>Department Name:</b>	<b>P 900 M.Sc. Data Science</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO1 Statistical computing Ability to understand the basic concepts in Data Science and Statistics, how to explore the datasets using statistical analysis techniques in Python and R.</p> <p>PO2 Applied Mathematical Skills: Ability to understand and implement various algorithms, Mathematical models in view of the real world scenario, which require competence in mathematical skills</p> <p>PO3 Big Data and Data management: Ability to Execute queries, implement views and joins, use MongoDB for various operations on unstructured data. Ability to Optimize business decisions and create competitive advantage with Big Data analytics and understand architectural concepts of Hadoop and map reduce paradigm</p> <p>PO4 Use of various software and Tools: This enables the students to develop strong programming skills required to handle complex data and build algorithms that will provide efficient solutions to the problem at hand; also hands on experience on various Data Analytics Tools</p> <p>PO5 Machine learning and Deep Learning: Understand a wide variety of learning algorithms, how to evaluate models generated from data and apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.</p> <p>PO6 Enabling technologies for Domains A set of Technologies being used in Data Analytics and various models such as Financial Modeling, Marketing Analytics, Social Media Analytics etc.</p> <p>PO8 Advanced Statistical Analysis: Mastering of a suite of methods and workflow styles that will enable the student to produce several new statistical analysis correctly and efficiently present the results from those analyses.</p> <p>PO9 Societal development: Identify the information security models and their characteristics, by analysing the different types of cryptographic and forensic methods. Identify and solve different cyber security threats that hamper the society.</p> <p>PO10 Application of Skills and Capstone Projects Provide the knowledge and necessary skills to accomplish various analytics with respect to areas like health, HR Analytics, Retail Analytics, Health, Sports &amp; Fitness, Finance etc ... These application areas being used effectively for the Capstone Project.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	

**PO1 Computational Knowledge:**

Apply knowledge of mathematics, computing fundamentals, data analytics, software engineering concepts and application development knowledge appropriate for the computing specialization

**PO2 Problem Analysis:**

Identify, formulate, design and develop applications to analyze and solve computer science related problems

**PO3 Design /Development of Solutions:**

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4 Conduct investigations of complex Computing problems:**

Use appropriate review literatures, research methodologies, techniques and tools, design, conduct experiments, analyze and make inferences from the resulting data.

**PO5 Modern Tool Usage:**

Create, Select, Integrate and apply efficiently appropriate techniques, resources, and modern computing tools to solve complex problem, with an understanding of the limitations.

**PO6 Professional Ethics:**

Understand and work with a professional context pertaining to ethics with appropriate societal and cyber regulations in a global economic environment

**PO7 Life-long Learning:**

Recognize and develop the passion for a continued career development and progress as a computer professional

**PO8 Project management and finance:**

Apply the principles of management with computing knowledge to manage the projects effectively both as a team leader and team member on multidisciplinary environments

**PO9 Communication Efficacy:**

Communicate effectively with the computing community as well as society by being able to make effective presentations and design documentation with respect to appropriate standards.

**PO10 Societal and Environmental Concern:**

Ability to utilize the computing knowledge efficiently in projects to analyze the global and local impact of business solutions for societal, environmental, and cultural aspects

**PO11 Individual and Team Work:**

Develop the ability to act as a member or leader for the fulfillment of diverse teams in multidisciplinary environments.

PO12 Innovation and Entrepreneurship: Develop and design innovative methodologies to create value as a successful entrepreneur and wealth for betterment of individual and society at large.
<b>Subject and code: PH 901.1 : STATISTICS FOR DATA SCIENCE</b>
<b>Course Outcomes:</b>
Learning Outcomes: On successful completion of the course students will be able: CO1 : To demonstrate proficiency with statistical analysis of data. CO2 : To develop the ability to build and assess data-based models. CO3 : To execute statistical analyses with professional statistical software. CO4 : To apply data science concepts and methods to solve problems in real-world contexts CO5 : To create and communicate these solutions effectively
<b>Subject and code: PH 902.1 : BIG DATA AND DATA MANAGEMNT</b>
<b>Course Outcomes:</b>
Learning Outcomes: On successful completion of the course students will be able: CO1: Understand MapReduce as a computation model and an execution framework CO2: Work with following tools in the big data application stack: Hadoop, YARN, Hive, Pig, Spark, and perhaps others... CO3: Realize how different tools in the Hadoop stack fit in the big picture of big data analytics CO4: Design distributed machine learning algorithms CO5: Use cloud computing services (Amazon Web Services) to build your clusters and run large-scale data processing applications
<b>Subject and code: PH 903.1 : MATHEMATICS FOR DATA SCIENCE</b>
<b>Course Outcomes:</b>
Learning Outcomes: Upon successful completion of this course, a student will be able to: CO1 : Students will formulate complete, concise, and correct mathematical proofs. CO2 : Students will frame problems using multiple mathematical and statistical representations of relevant structures and relationships and solve using standard techniques. CO3 : Students will create quantitative models to solve real world problems in appropriate contexts. CO4 : Students will effectively use professional level technology tools to support the study of mathematics and statistics. CO5 : Students will clearly communicate quantitative ideas both orally and in writing to a range of audiences.
<b>Subject and code: PH 904.1 : ALGORITHMS FOR ADVANCED DATA ANALYTICS</b>
<b>Course Outcomes:</b>
Learning Outcomes: On successful completion of the course students will: CO1 : Analyze the asymptotic performance of algorithms. CO2 : Write rigorous correctness proofs for algorithms. CO3 : Demonstrate a familiarity with major algorithms and data structures. CO4 : Apply important algorithmic design paradigms and methods of analysis. CO5 : Synthesize efficient algorithms in common engineering design situations.

<b>Subject and code: PH 905.1 P DATA SCIENCE and STATISTICAL ANALYSIS LAB</b>
<b>Course Outcomes:</b>
<p>Learning Outcomes: This course provides majors with the skills needed to utilize statistical techniques for addressing quantitative, data-based problems in fields such as biological and social sciences, engineering and technology, business and finance, law, and health and education. Students graduating with a Statistics degree will learn the basics of</p> <p>CO1 : Statistical reasoning and inferential methods</p> <p>CO2 : Statistical modeling and its limitations</p> <p>CO3 : Interpreting and communicating the results of a statistical analysis</p> <p>CO4 : Data analysis using statistical computing tools and software</p> <p>CO5: Probability and the mathematical foundations of statistics</p>
<b>Subject and code: PS 906.1 : DATA WAREHOUSE AND DATA MINING</b>
<b>Course Outcomes:</b>
<p>Learning Outcomes: By the end of the module, the student should</p> <p>CO1 : Display a comprehensive understanding of different data mining tasks and the algorithms most appropriate for addressing them.</p> <p>CO2 : Evaluate models/algorithms with respect to their accuracy.</p> <p>CO3 : Perform a self directed piece of practical work that requires the application of data mining techniques.</p> <p>CO4: Develop hypotheses based on the analysis of the results obtained and test them.</p> <p>CO5: Conceptualize a data mining solution to a practical problem.</p>
<b>Subject and code: PS 907.1 P ADVANCED ALGORITHMS AND DATA MINING USING R LAB</b>
<b>Course Outcomes:</b>
<p>Learning Outcome: Upon completion of the subject, students will be able to</p> <p>CO1 : Examine the concepts of data warehousing and OLAP;</p> <p>CO2 : Apply the concepts of BI and DM techniques for clustering, association, and classification;</p> <p>CO3 : Understand the operation procedures of BI projects in an organization;</p> <p>CO4 : Select appropriate DM tools and methods to manipulate and achieve data;</p> <p>CO5 : Apply DM concepts for formulating business strategies and programs to enhance business intelligence.</p>
Semester-II
<b>Subject and code: PH 901.2 : MULTIVARIATE TECHNIQUES FOR DATA SCIENCE</b>
<b>Course Outcomes:</b>
<p>Learning Outcome: On successful completion of the course the student</p> <p>CO1 : Will appreciate the range of multivariate techniques available,</p> <p>CO2 : Will be able to summarize and interpret multivariate data,</p> <p>CO3 : Will have an understanding of the link between multivariate techniques and corresponding univariate techniques,</p> <p>CO4 : Will be able to use multivariate techniques appropriately at application level</p> <p>CO5 : Undertake multivariate hypothesis tests, and draw appropriate conclusion</p>
<b>Subject and code: PH 902.2 : MACHINE LEARNING ALGORITHMS</b>
<b>Course Outcomes:</b>
<p>Learning outcomes:</p> <p>CO1 : To implement a neural network for an application of your choice using an available tool.</p>

CO2 : To implement probabilistic discriminative and generative algorithms for an application of your choice and analyze the results.
CO3 : To use a tool to implement typical clustering algorithms for different types of applications.
CO4 : To design and implement an HMM for a sequence model type of application
CO5 : To identify applications suitable for different types of machine learning with suitable justification
<b>Subject and code: PH 903.2 P MACHINE LEARNING AND DATA ANALYTICS LAB</b>
<b>Course Outcomes:</b>
Learning Outcome: Upon completion of the subject, students will be able to
CO1 : Setup and solve typical machine learning problems, by implementation or by using established computer simulation tools.
CO2 : Decide which machine learning methods/algorithms are suitable for which type of learning problems, i.e. know about their most important weaknesses and advantages.
CO3 : Decide how to represent data to facilitate learning.
CO4 : Recognise typical effects of bad initialisation and parameter selection and suggest ways to improve the results.
CO5 : Describe how, and why, machine learning and natural computation methods work,
<b>Subject and code: PS 904.2: PROBABILITY AND STOCHASTIC PROCESS MODELS</b>
<b>Course Outcomes:</b>
Learning outcomes:
CO1 : Introduction to the basic concepts of probability and their importance. And Understanding the statistical applications..
CO2 : Understand the principles of probability and the concept of probability distributions,
CO3 : To be familiar with Binomial, Poisson, Geometric, Normal and Exponential probability distributions and their applications.
CO4 : To be familiar with the random variables and their use.
CO5 : Understand the concept of Markov chains and study the transition diagram.
<b>Subject and code: PS 905.2: PREDICTIVE MODELING AND FINANCIAL ANALYTIC</b>
<b>Course Outcomes:</b>
Learning Objectives: Students who complete this course will be able to
CO1 : Have a high- level understanding of the benefits and objectives of marketing analytics.
CO2 : Apply metrics -driven techniques to improve marketing decisions.
CO3 : Understand best practices through case studies.
CO4 : Learn by doing through hands-on computer spreadsheet models and metric
CO5 : Design and analyze appropriate predictive models.& apply statistical tools for analysis
<b>Subject and code: PS 904.2 : DATA SCIENCE AND HEALTH ANALYTICS</b>
<b>Course Outcomes:</b>
CO1 : Discuss the policy process for improving the health status of populations
CO2 : Apply "systems thinking" for resolving organizational problems
CO3 : Apply quality and performance improvement concepts to address organizational performance issues

CO4 : Describe how the public health information infrastructure is used to collect, process, maintain, and disseminate data
CO5 : Use information technology to access, evaluate, and interpret public health data
<b>Subject and code: PS 905.2 : MARKETING ANALYTICS AND OPERATIONS RESEARCH</b>
<b>Course Outcomes:</b>
CO1 : Have a high- level understanding of the benefits and objectives of marketing analytics.
CO2 : Apply metrics -driven techniques to improve marketing decisions.
CO3 : Understand best practices through case studies.
CO4 : Learn by doing through hands-on computer spreadsheet models and metric
CO5 : Design and analyze appropriate predictive models.& apply statistical tools for analysis
<b>Subject and code:PS 904.2 : PYTHON FOR DATA SCIENCE</b>
<b>Course Outcomes:</b>
CO1 : Be familiar with the entire procedure of conducting a data analysis project
CO2 : Perform exploratory data analysis using Python's Scipy/Numpy libraries , visualization tools
CO3 : Prepare data for complex statistical analysis by working with SQL databases, complex joins/merging using Python's Pandas library
CO4 : Build statistical inference models with regression, bayesian methods, clustering techniques
CO5 : Data visualization and presentations with Python's matplotlib, Bokeh, Plotly libraries
<b>Subject and code: PS 905.2: NoSQL, MapReduce with Hadoop</b>
<b>Course Outcomes:</b>
CO1 : Identify Big Data and its Business Implications.
CO2 : List the components of Hadoop and Hadoop Eco-System
CO3 : Access and Process Data on Distributed File System
CO4 : Manage Job Execution in Hadoop Environment
CO5 : Develop Big Data Solutions using Hadoop Eco System
<b>Subject and code:</b>
<b>PS 906.2 P DATA SCIENCE / APPLICATION / BIG DATA TECHNOLOGY LAB</b>
<b>Course Outcomes:</b>
CO1 : Examine the concepts of data warehousing and OLAP;
CO2 : Apply the concepts of BI and DM techniques for clustering, association, and classification;
CO3 : Understand the operation procedures of BI projects in an organization;
CO4 : Select appropriate DM tools and methods to manipulate and achieve data;
CO5 : Apply DM concepts for formulating business strategies and programs to enhance business intelligence.
<b>Subject and code: PO 907.2: STATISTICAL DATA ANALYSIS USING R</b>
<b>Course Outcomes:</b>
CO1 : Be able to use and program in the programming language R
CO2 : Be able to use R to solve statistical problems
CO3 : Be able to implement and describe Monte Carlo the technology
CO4 : Be able to minimize and maximize functions using R

CO5 : Be competent in Data Visualization using R
<b>Semester-II</b>
<b>Subject and code: PH 901.3 : COMPUTATIONAL INTELLIGENCE AND DEEP LEARNING</b>
<b>Course Outcomes:</b>
CO1 : Gain a working knowledge of knowledge-based systems, neural networks, fuzzy systems, and evolutionary computation;
CO2 : Apply intelligent systems technologies in a variety of engineering applications;
CO3 : Implement typical computational intelligence algorithms in Python
CO4 : Present ideas and findings effectively; and e. Think critically and learn independently.
CO5 : Application of Fuzzy and Genetic Algorithms in the mainline areas
<b>Subject and code: PH 902.3 : DATA SCIENCE AND INTERNET OF THINGS</b>
<b>Course Outcomes:</b>
CO1 : Demonstrate knowledge, understanding of the security and ethical issues of the Internet of Things
CO2 : Conceptually identify vulnerabilities, including recent attacks, involving the Internet of Things
CO3 : Conceptually describe countermeasures for Internet of Things devices
CO4 : Analyze the societal impact of IoT security events & Develop critical thinking skills
CO5 : Compare and contrast the threat environment based on industry and/or device type
<b>Subject and code: PH 903.3 P COMPUTATIONAL INTELLIGENCE AND INTERNET OF THINGS LAB</b>
<b>Course Outcomes:</b>
CO1 : Examine the concepts of data warehousing and OLAP;
CO2 : Apply the concepts of BI and DM techniques for clustering, association, and classification;
CO3 : Understand the operation procedures of BI projects in an organization;
CO4 : Select appropriate DM tools and methods to manipulate and achieve data;
CO5 : Apply DM concepts for formulating business strategies and programs to enhance business intelligence.
<b>Subject and code: PS 904.3 : MODELING, SIMULATION AND DATA SCIENCE</b>
<b>Course Outcomes:</b>
CO1 : Problem formulation - System definition - Model translation - Verification,- validation Experimental design - Analysis (Skills)
CO2 : Use the simulation software to: - carry out simulation tasks;
CO3 : Use graphs to present their results;
CO4 : Write scripting languages to generate other reports.
CO5 : Apply the Modeling and Simulation
<b>Subject and code: PS 905.3 : TIME SERIES ANALYSIS AND FORECASTING</b>
<b>Course Outcomes:</b>
CO1 : Have deeper knowledge of statistical theory and methods particularly common problems in economical social sciences especially economics.
Co2 : Be able to estimate models for time-series data.
CO3 : Be able to interpret the results of an implemented statistical analysis
CO4 : Be aware of limitations and possible sources of errors in the analysis
CO5 : Have ability to present results in oral and written form

<b>Subject and code: PS 904.3 : REAL TIME DATA ALAYTICS WITH STREAMING DATA</b>
<b>Course Outcomes:</b>
CO1 : Describe and use a wide variety of streaming analytics methods in a business or an industry.
CO2 : Understand how analytics can be used in business development
CO3 : Learn to use and to apply a selection of modern business analytics tools and software to solving real-world problems with real-world data
CO4 : Demonstrate hands-on skills in applying business analytics to real-world business.
CO5 : Application of Real Time Data Analytics and Streaming data into real world areas.
<b>Subject and code: PS 905.3 : SOCIAL MEDIA AND NETWORK ANALYTICS</b>
<b>Course Outcomes:</b>
CO1 : Apply multiple quantitative and qualitative methods
CO2 : Understand sources and limitations of web-based data
CO3 : Perform social network analysis to identify important social actors, subgroups and network properties in social media sites such as Twitter, Facebook, and YouTube
CO4 : Use appropriate information visualization technique to gain insights into large datasets
CO5 : Apply best practices in Search Engine Optimization
<b>Subject and code:PS 904.3 : BIG DATA ANALYTICS WITH SCALA AND SPARK</b>
<b>Course Outcomes:</b>
CO1 : Understand what Big Data is and why classical data analysis techniques are no longer adequate
CO2 : Understand the benefits that Big Data can offer to businesses and organisations
CO3 : Understand conceptually how Big Data is stored, retrieved and used
CO4 : Understand how Big Data can be analysed to extract knowledge
CO5 : Communicate with data scientists and apply the methods in real scenarios
<b>Subject and code: PS 905.3 : DATA VISUALIZATION USING TABLEAU</b>
<b>Course Outcomes:</b>
CO1 : Key concepts in data science, including tools, approaches and application scenarios
CO2 : Topics in information design, interaction design and user engagement
CO3 : Understand and apply the fundamental concepts and techniques in data visualization
CO4 : Solve specific real-world problems related to the visualisation and interpretation of data analysis results
CO5 : Use of Data Visualization in Business, Retail, Health, Sports Analtics
<b>Subject and code: PS 906.3 P DATA SCIENCE / APPLICATION / BIG DATA TECHNOLOGY LAB</b>
<b>Course Outcomes:</b>
CO1 : Demonstrate the knowledge of big data, data science, data analytics, distributed file systems, parallel MapReduce paradigm, NoSQL, machine learning, etc.
CO2 : Program and implement examples of big data and NoSQL applications using open sourceHadoop, HDFS, Spark, Scala, Tableau etc.
CO3 : Read current research papers and implement example research group project in big data.
CO4 : Use of Real time Data Sets in Analysis and use of Tools

CO5 : Application of Ontology and Web Analytics in real scenario
<b>Subject and code: PO 907.3 : DATA SCIENCE AND SYSTEMS THINKING</b>
<b>Course Outcomes:</b>
CO1 : Describe accurately the set of key systems concepts of Systems and Big data CO2 : Understand what is distinctive about systems thinking as opposed to other forms of thinking CO3 : Understand how systems thinking is useful in analysing and improving situations CO4 : Understand the use of Big Data in Systems Thinking i.e in various applications CO5 : Use of Data Science effectively to integrate and produce a larger system with creativity
<b>Subject and code: SEMINAR AND TECHNICAL COMMUNICATION</b>
<b>Course Outcomes:</b>
Course Outcomes: ☐ Gather, organize, summarize and interpret literature with the purpose of formulating a proposal. ☐ Write a technical report summarizing state-of-the-art on an identified topic. ☐ Present the study using graphics and multimedia techniques. ☐ Define intended future work based on the technical review.
<b>Semester-IV</b>
<b>Subject and code: INDUSTRY INTERNSHIP / PROJECT WORK / DISSERTATION</b>
<b>Course Outcomes:</b>
Considerably more in-depth knowledge of the major subject/field of study, including deeper insight into current research and development work. <ul style="list-style-type: none"> <li>• Deeper knowledge of methods in the major subject/field of study.</li> <li>• A capability to contribute to research and development work.</li> <li>• The capability to use a holistic view to critically, independently and creatively identify, formulate and deal with complex issues.</li> <li>• The capability to plan and use adequate methods to conduct qualified tasks in given frameworks and to evaluate this work.</li> <li>• The capability to create, analyse and critically evaluate different technical/architectural solutions.</li> <li>• The capability to critically and systematically integrate knowledge.</li> <li>• The capability to clearly present and discuss the conclusions as well as the knowledge and arguments that form the basis for these findings in written and spoken English.</li> <li>• The capability to identify the issues that must be addressed within the framework of the specific thesis in order to take into consideration all relevant dimensions of sustainable development.</li> <li>• A consciousness of the ethical aspects of research and development work.</li> </ul>

# POS, PSOS, COS

<b>Department Name:</b>	<b>G 100A</b> <b>Economics</b>
<b>PROGRAMME OUTCOMES</b>	
PO 3: Enable to apply quantitative techniques suitable for the discipline. PO 4: Analyze the policies of the government in solving economic problems. PO 5: Develop skills required to blend the subject learned and the real-life situations. PO 6: Able to evaluate the working of the economy, its interconnection with the social, political, cultural, environmental, ethical issues in a comprehensive manner.	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
PSO 1: Enable the students with the knowledge of Economics both theoretical and applied. PSO 2: Develop a comprehensive understanding of the various aspects of the branches of Economics related to micro and macro aspects. PSO 3: Understand the working of the domestic and foreign economy. PSO 4: Enable the students to apply the theoretical knowledge of Economics in applying to the real-life situations. PSO 5: Analyse the issues related to various problems like unemployment, balance of payments, poverty, inequality, inflation facing the economy. PSO 6: Develop skills to integrate and organise the inter linkages between and among the varied divisions of the economy. PSO 7: Have a critical assessment of the working of the economy, the interconnections between the various sectors and the policies linked to the development.	
<b>Semester- I</b>	
<b>Subject and code: BASIC ECONOMICS – I ( G 102 DC1.1)</b>	
<b>Course Outcomes:</b>	
CO 1: Identify the facets of an economic problem. CO 2: Learn basic economic concepts and terms. CO 3: Explain the operation of a market system. CO 4: Analyze the production and cost relationship of a business firm. CO 5: Evaluate the market decisions under different structure. CO 6: Use basic cost benefit calculations as a means of decision making.	
<b>Subject and code: CONTEMPORARY INDIAN ECONOMY ( G 102 DC2.1)</b>	

<b>Course Outcomes:</b>
CO 1: Students will be informative about the nature of Indian Economy. CO 2: Students will be able to understand the current problems of Indian economy. CO 3: Students will be able evaluate the impact of LPG policies on economic growth in India. CO 4: Students will be able to review various the sector specific policies adopted for achieving the aspirational goals.
<b>Subject and code: Development Studies ( G 102 OE1.1)</b>
<b>Course Outcomes:</b>
CO 1: Students will develop a critical understanding of the contemporary issues in Indian economic development. CO 2: Students will thus be better prepared to face the professional world and can use this knowledge base in a variety of jobs, including in the corporate.
<b>Subject and code: Business Economics (G 102 OE2.1)</b>
<b>Course Outcomes:</b>
CO 1: Acquired the concepts, tools and techniques of economics in analyzing and interpreting the business decisions. CO 2: Developed the insight of the functioning of the economy
<b>Subject and code : Pre-reforms Indian economy (G 102 OE2.1)</b>
<b>Course Outcomes:</b>
CO 1: Trace the evolution of Indian economy. CO 2: Students will be able to understand structural features of Pre reform Indian economy CO 3: Students will be able evaluate the planning model and policies on economic growth in India. CO 4: Students will be able to analyse various sector specific policies adopted for achieving the aspirational goals.
<b>Subject and code : Pre-reforms Indian economy (G 102 OE2.1)</b>
<b>Course Outcomes:</b>
CO 1: Explain how consumers make rational choices using the concept of utility CO 2: To understand the concept of consumer surplus. CO 3: Analyse the factors that affect market demand and market supply and illustrate their interaction for achieving equilibrium in price and quantity. CO 4: Analyse how producer applies the marginal decision rule to maximize the profit in producing goods or services.
<b>Semester- II</b>
<b>Subject and code: Basic Economics -II (G 102 DC1.2)</b>
<b>Course Outcomes:</b>
CO 1: Understand about the operation of the overall economic system. CO 2: Calculate national income and related aggregates. CO 3: Explain the relationship between macroeconomic aggregates CO 4: Analyse the nature of business cycles and policies to control them. CO 5: Evaluate the macroeconomic policies for solving major problems like poverty and

unemployment.
<b>Subject and code : Karnataka economy ( G 102 DC2.2 )</b>
<b>Course Outcomes:</b>
CO 1: Understand the nature, growth and problems of economy of Karnataka. CO 2: Explain the process of growth of Karnataka Economy. CO 3: Evaluate the policies and programmes undertaken by the Govt. of Karnataka for bringing about socio economic development.
<b>Subject and code: Economics of Business Environment( G 102 OE1.2)</b>
<b>Course Outcomes:</b>
CO 1: Explain the elements of Business environment. CO 2: Identify the environmental constraints in the growth of a business firm. CO 3: Analyze the ways to utilise the current environmental conditions to achieve higher business growth.
<b>Subject and code: Managerial Economics (G 102 OE1.2)</b>
<b>Course Outcomes:</b>
CO 1: To know the basic knowledge of managerial economics. CO 2: To understand the dynamics of business. CO 3: To know about the managerial concept of business CO 4: Helps the consumers and producers to take apt decisions
<b>Subject and code: Contemporary Indian Economy (G 102 OE1.2)</b>
<b>Course Outcomes:</b>
CO 1: Students will be informative about the nature of Indian Economy. CO 2: Students will be able to understand the current problems of Indian economy. CO 3: Students will be able evaluate the impact of LPG policies on economic growth in India.
<b>Subject and code: Monetary Economics (G 102 OE1.2)</b>
<b>Course Outcomes:</b>
CO 1: Understand the current monetary policy and problems CO 2: Identify and analyse monetary instruments CO 3: Review the various trends and functions of monetary and financial institutions
<b>Subject and code: Sustainable Development (G 102 OE1.2)</b>
<b>Course Outcomes:</b>
CO 1: Understand the interconnection within the ecosystem of all living beings. CO 2: Identify the importance of sustainability. CO 3: Identify factors to find solutions to environment problems that are relevant to protect the welfare of the people.
<b>Semester- III</b>
<b>Subject and code: Micro Economics (G 102 DC1.3)</b>
<b>Course Outcomes:</b>
CO 1: Identify the facets of an economic problem. CO 2: Learn basic economic concepts and terms. CO 3: Explain the operation of a market system. CO 4: Analyse the production and cost relationship of a business firm.

CO 5: Evaluate the market decisions under different structure.
CO 6: Use basic cost benefit calculations as a means of decision making.
<b>Subject and code:</b> Statistics for Economics (G 102 DC2.3)
<b>Course Outcomes:</b>
CO 1: Calculate basic descriptive and inferential statistics.
CO 2: Interpret descriptive and inferential statistics.
CO 3: Explain the process of hypothesis testing.
<b>Subject and code:</b> Economics of Insurance (G 102 OE1)
<b>Course Outcomes:</b>
CO 1: Understand various types of Insurance
CO 2: Understand various risks and Benefits of Insurance
<b>Subject and code:</b> Money and Public Finance (G 102 OE2.3)
<b>Course Outcomes:</b>
CO 1: Understand the meaning of public finance or government finance; its nature, subject matter, explain the differences between public finance and private finance and differentiate between the public and private goods
CO 2: Classify the public revenue and its various sources; revenue receipts and non-revenue receipts, understand the tax and no-tax revenues, the causes of increasing public expenditure in the modern Economies
CO 3: Explain the varying effects of public expenditure on the economy and role of public expenditure in a developing economy
CO 4: Understand the various sources of government borrowing and the reasons behind the growing public debt, describe how the debt is repaid, the role of public debt in developing countries.
<b>Subject and code: Money and Public Finance (G 102 OE2.3)</b>
<b>Course Outcomes:</b>
CO 1: Understand the meaning of public finance or government finance; its nature, subject matter, explain the differences between public finance and private finance and differentiate between the public and private goods
CO 2: Classify the public revenue and its various sources; revenue receipts and non-revenue receipts, understand the tax and no-tax revenues, the causes of increasing public expenditure in the modern Economies
CO 3: Explain the varying effects of public expenditure on the economy and role of public expenditure in a developing economy
CO 4: Understand the various sources of government borrowing and the reasons behind the growing public debt, describe how the debt is repaid, the role of public debt in developing countries.
<b>Semester- IV</b>
<b>Subject and code:</b> Macro Economics (G 102 DC1.4)

<b>Course Outcomes:</b>
CO 1: On successful completion of the course the student is expected to get CO2: a thorough understanding of the various theories behind pricing of products and factors in different market environment. CO 3: Ability to identify and evaluate the main models of market structures and to appreciate the theories behind policy prescriptions. CO 4: This course in Macroeconomics is expected to develop skill in economic reasoning. By the time, students complete this course, they would know the relevance of government decisions like Wage policy, monetary policy, the RBI policy, etc. in the day-to-day life.
<b>Subject and code: Mathematics for economics (G 102 dc 2.4)</b>
<b>Course Outcomes:</b>
CO 1: Perform basic operations in Vectors and Matrix algebra. CO 2: Calculate limits, derivatives and integrals of functions of multiple variables. CO 3 : Calculate Optima for constrained and unconstrained optimization problems encountered in Economics.
<b>Subject and code: Entrepreneurial economics (G 102 OE 1.4)</b>
<b>Course Outcomes:</b>
CO 1: Understand various concepts of entrepreneurship CO 2: Absorb Skills of entrepreneurship CO 3: Understand various sources of financing project
<b>Subject and code: International economics (G 102 OE 1.4)</b>
<b>Course Outcomes:</b>
CO 1: Able to identify and analyse different theoretical models of international economics in light of real-world situations. CO 2: Understand major issues in international finance CO 3: Able to deal with the problems of international finance analytically CO 4: Explain the different concepts of terms of trade , the structure of BOP, disequilibrium in BOP, causes of disequilibrium , describe the foreign exchange rate and Determine its equilibrium exchange rate and explain the objectives of IMF and IBRD.
<b>Semester- V</b>
<b>Subject and code: G 102.5 :ECONOMIC THOUGHT</b>
<b>Course Outcomes:</b>
CO 1: Students will be informative about the contribution of eminent economists to the subject and will be able to understand the background of their writings and theories which help them to know the significance of economics at present times.
<b>Subject and code: G102.5a: ECONOMIC STATISTICS (Optional)</b>
<b>Course Outcomes:</b>
CO1: Apply correctly a variety of statistical techniques, both descriptive and inferential CO2: Use graphical and numerical methods to calculate and illustrate descriptive statistics CO3: Use the basic concepts of probability
<b>Subject and code: G 102.5b :DEVELOPMENT ECONOMICS</b>

<b>(Optional)</b>
<b>Course Outcomes:</b>
CO1: To understand the basic problems of different countries economy. CO2: To know the different model adopted by the various countries. CO3: To select appropriate model for the development and growth of the countries.
<b>Subject and code: G 102.5c : HEALTH ECONOMICS (Optional Paper)</b>
<b>Course Outcomes:</b>
CO1: Get a working knowledge of economics of health CO2: Describe key behaviours that affect a consumer's health status and the cost of health care overall. CO3: Be able to identify the concepts of healthcare financing and payment for healthcare CO4: Be able to provide an overview of how health insurance works and to compare and contrast different types of health insurance
<b>Semester- VI</b>
<b>Subject and code: G 102.6: INDIAN ECONOMICS</b>
<b>Course Outcomes:</b>
CO1: Students will be informative about the nature of Indian Economy, GDP, demographic profile, natural resources, all the three sectors and sectoral reforms, economic planning and steps taken for development of Indian Economy.
<b>Subject and code: G102.6a : MATHEMATICAL ECONOMICS</b>
<b>Course Outcomes:</b>
CO1: To Apply some mathematical methods to economic theories CO2: Using calculus and differential equations in the economic models CO3: Use economic integration in applications CO4: Using Optimization and linear programming in solving mathematical problems
<b>Subject and code: G 102.6b: MANAGERIAL ECONOMICS</b>
<b>Course Outcomes:</b>
CO1: To know the basic knowledge of managerial economics. CO2: To understand the dynamics of business. CO3: Helps the consumers and producers to take apt decisions.
<b>Subject and code: G 102.6c : ENVIRONMENTAL ECONOMICS</b>
<b>Course Outcomes:</b>
CO1: Have a detailed understanding of the discipline of environmental economics, including its key principles and methods. CO2: Be able to use economic techniques to analyse environmental problems and to assess environmental policies. CO3: Apply economic analysis to the management of the environment and natural resources.

<b>Department Name:</b>	<b>G100 A HISTORY</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO1. Learn a basic narrative of historical events in a specific region of the world in a specific time frame.</p> <p>PO2. Articulate factual and contextual knowledge of specific places and times to make careful comparisons (Across time space and culture)</p> <p>PO3. Have the ability to use bibliographical tools for the advanced study of history.</p> <p>PO4. Understand and evaluate different historical ideas various arguments and point of view.</p> <p>PO5. Develop an appreciation of themselves and of other through the study of the past in local, regional, national and global context.</p> <p>PO6. Have an appreciation of the uniqueness of visual evidence and cultivate a particular skill of using visual evidence to understand human activity of the recent and distant past.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO 1:History as a subject is considered to be the memory of mankind. In the Department of History, papers such as Indian History, History of Modern Europe, History of Modern Asia and History of Karnataka are taught. It is a balanced curriculum in the under graduate level keeping with the emphasis of world, regional, national and local histories.</p> <p>PSO 2: On the completion of the course a student with this knowledge which is essential for getting into any service/employment be it government or private, will be able to pass the competitive exams,since eligibility tests to enter such service requires the student to know these subjects.</p> <p>PSO 3: Apart from this competence, a student who as an individual and a citizen would acquire a fair amount of knowledge of History of different spheres national, regional and so on</p> <p>PSO 4: The students would also recognize various countries, extent of various kingdoms and empires and places through the map study</p> <p>PSO 5: The study tours will enable the students to recognize the heritage centers/symbols and history as case studies.</p>	
<b>Semester- I</b>	
<b>Subject and code: Political history of Karnataka (BCE-3 to 10 CE) Part-1 ( G101 DC1.1)</b>	
<b>Course Outcomes:</b>	
<p>CO1: Understand the continuity of political developments and strategies.</p> <p>CO2: Analyse the importance of causes for the rise of regional political dynasties.</p> <p>CO3: Understand contextual necessities which influenced the era of political supremacy.</p> <p>CO4: Understand and describe the contemporary political history. Appreciate the confluence of diverse political elements.</p>	
<b>Subject and code: CULTURAL HERITAGE OF INDIA ( G101 DC2.1)</b>	

<b>Course Outcomes:</b>
CO1: Provide an insight about an extensive survey of heritage of India CO2: Familiarize Indian history and culture CO3: Have an expertise to analyse further development of culture of India CO4: Analyse the factor responsible for origin and decline of culture CO5 :Provide the opportunity to understand the process of cultural development
<b>Subject and code : OE - CULTURAL HISTORY OF KARNATAKA (CE 3- CE 10) PART -1( G101 OE1.1)</b>
<b>Course Outcomes:</b>
CO1:Provide an insight about the cultural development of Karnataka. CO2: Familiarize Karnataka history and culture. CO3: Have an expertise to analyze further development of culture of Karnataka. CO4: Analyze the factors responsible for origin and decline of dynasties. CO5: Provide the opportunity to understand the process of cultural diversities.
<b>Semester- II</b>
<b>Subject and code: POLITICAL HISTORY OF KARNATAKA (CE11- 1750 CE) PART-2(G101 DC1.2)</b>
<b>Course Outcomes:</b>
CO1:Understand the rise and fall of Political dynasties in Karnataka. CO2: Familiarize with the patterns of administration. CO3: Analyze the traditional values and ethos of political development. CO4: Understand the rise and fall of regional variations. CO5: Study the complexities involved in polity of the time.
<b>Subject and code: CULTURAL HERITAGE OF KARNATAKA (G101 DC2.2)</b>
<b>Course Outcomes:</b>
CO1: Understand the concept of cultural heritage of Karnataka Study various cultural factors which influence the flow of culture CO2: Familiarize the factors which influenced in influencing culture and society CO3: Analyze the factors responsible for formation of pluralistic society CO4: Understand the concept “Unity in diversity”.

<b>Subject and code: OE -CULTURAL HISTORY OF KARNATAKA (11 CE TO 1750 CE) PART – 2 (G101 OE1.2)</b>
<b>Course Outcomes:</b>
CO1: Understand the concept of cultural heritage of Karnataka CO2: Study various cultural factors which influence the flow of culture CO3: Familiarize the factors which influenced in influencing culture and society CO4: Analyze the factors responsible for formation of pluralistic society Understand the concept “Unity in diversity”.
<b>Semester- III</b>
<b>Subject and code: POLITICAL HISTORY OF INDIA (From Indus culture to 1206 AD) (G 101 DC1.3)</b>
<b>Course Outcomes:</b>
CO1: Understand the history and culture of Political History of India region. CO2:Analyse the importance of causes for backwardness of this region. CO3:Understand the influence of political influence on the people and culture of this region. CO4 Understand the political, Social, Religious and Cultural history of the region. CO5: Appreciate the divergent cultural and communal harmony of this region.
<b>Subject and code :Regional History - History of the Ancient Tulunadu G101 DC2.3</b>
<b>Course Outcomes:</b>
CO1: Understand the history and culture of Tulunadu. CO2: Analyse the importance of causes for backwardness of this region. CO3: Understand the influence of political influence on the people and culture of this region. CO4: Understand the political, Social, Religious and Cultural history of the region. CO5: Appreciate the divergent cultural and communal harmony of this region.
<b>Subject and code : OE - Freedom Movement in Karnataka (1800-1947) G101 OE 1.3</b>
<b>Course Outcomes:</b>

CO1: Understand the Freedom Movement in Karnataka (1800-1947)
CO2: Analyse the importance of causes for backwardness of this region. Understand the influence of Freedom Movement in Karnataka (1800-1947)
CO3: Understand the political, Social, Religious and Cultural history of the region.
CO4: Appreciate the divergent cultural and communal harmony of this region.
<b>Semester- IV</b>
<b>Subject and code: Political History of India (History of Medieval India AD 1206 -1761) Part-2 - G101 DC1.4</b>
<b>Course Outcomes:</b>
CO1: Understand the Political History Medieval India (from 1206 to 1761). Analyse the importance of causes for backwardness of this region.
CO2: Understand the influence of Political History Medieval India (from 1206 to 1761).
CO3: Understand the political, Social, Religious and Cultural history of the region.
CO4: Appreciate the divergent cultural and communal harmony of this region.
<b>Subject and code: Cultural History of India (From Saraswati - Indus Culture to 1206 CE). - G101 DC2.4</b>
<b>Course Outcomes:</b>
CO1: Understand the History of Cultural History of India (From Saraswati - Indus Culture to 1206 CE). Analyse the importance of causes for backwardness of this region.
CO2: Understand the influence of History of Cultural History of India (From Saraswati - Indus Culture to 1206 CE).
CO3: Understand the political, Social, Religious and Cultural history of the region.
CO4: Appreciate the divergent cultural and communal harmony of this region.
<b>Subject and code: OE- Freedom Movement in India (1885-1947) G101 OE1.4</b>

<b>Course Outcomes:</b>
<p>CO1: Understand the History of Freedom Movement in India (1885-1947).</p> <p>CO2: Analyse the importance of causes for backwardness of this region.</p> <p>CO3: Understand the influence of History of Freedom Movement in India (1885-1947).</p> <p>CO4: Understand the political, Social, Religious and Cultural history of the region.</p> <p>CO5: Appreciate the divergent cultural and communal harmony of this region.</p>
<b>Semester- IV</b>
<b>Subject and code: Freedom Movement in India and its Legacy (A.D. 1885 – 1964) G101.5</b>
<b>Course Outcomes:</b>
<p>CO1: able to understand the domination of the colonial government and its reaction by the Indians. How Indians organized themselves to fight the long colonial domination will be understood by the students.</p> <p>CO2: In the history of the world how non-violent movement of Mahatma Gandhi triumphed is also taught. How by the mid twentieth century, India became independent and emerged as a prominent democratic country of the world is also taught.</p>
<b>Subject and code: G101.5a– Medieval Karnataka (A.D. 1336 – 1750)</b>
<b>Course Outcomes:</b>
<p>CO1: Able to understand the History of Karnataka State especially Karnataka in medieval period. In the medieval period great empires such as Vijayanagar and Bahmani flourished and contributed immensely to the History and culture of South India and Deccan. Vijayanagar was praised by the travelers as abode of wealth and prosperity, contributing immensely to the culture and heritage of the people of this region.</p>
<b>Subject and code G101.5b – History of the Far East and South East Asia(Since 1900)</b>
<b>Course Outcomes:</b>
<p>CO1: able to understand the History of Asia with special reference to China and Japan and also Vietnam and Indonesia. All these modern countries were abode of ancient civilizations and how in modern times came under imperialistic domination. How they fought imperialism just like Indians is taught. Presently, China has grown to become a super power and Japan too had reached its economic climax. China is a communist country as well as an economic giant. How these countries are faring in modern times is taught.</p>

Semester- V
<b>Subject and code: G101.6 History of Europe (A.D 1845-1945)</b>
<b>Course Outcomes:</b>
CO1: Able to understand the History of Europe from the rise of Nationalism in Western Europe towards the later part of nineteenth century till the Second World War and formation of United Nations. This paper also teaches the problems of decaying of Ottoman empire and related history as well as the conquest of Africa and rise of Nazism and Fascism. How the two world wars devastated the economy and society and its impact is also taught to the students.
<b>Subject and code: G101.6a -History of Modern Karnataka (A.D. 1750 - 1956)</b>
<b>Course Outcomes:</b>
CO1: able to understand the History of Modern Karnataka especially after the decline of Vijayanagara. How various palegars became independent rulers and how Mysore emerged as one of the strong states under Hyderali and his son Tippu Sultan. How they continued their fight against the imperialistic British who were following various tactics to put down the Indian rulers. This paper also teaches various movements like the backward class movement, independence movement as well as unification movement along with the progress the state of Karnataka made in modern times in spheres such as literature, education, art and so on.
<b>Subject and code: G101.6b History of the West and Central Asia(since 1900)</b>
<b>Course Outcomes:</b>
CO1: able to understand the History of Modern West and Central Asia including countries such as Turkey, Iran, Iraq, Arab World along with modern State of Israel and Palestinian Problem. West Asia also was colonized by the European powers and how they were continuously made to fight the British and other imperialistic hegemonies, is taught. Leaders such as Mustafa Kemal Pasha, Reza Shah Pahlavi, Dr Mosaddeq, Amanullah Khan and others are taught who were some of the rare leaders of the region. Paper also teaches contemporary history of the region with topics such as the rise of Taliban in Afghanistan.

<b>Department Name:</b>	<b>G100 B POLITICAL SCIENCE</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO 1: Demonstrate competency with the basic tools underlying the subject of Political Science (as a discipline of study and research)</p> <p>PO 2: Discern key concepts in politics, sharpen the understanding of political discourses and augment the ability to conduct scientific enquiry on political questions</p> <p>PO 3: Promote a healthy civic society, contribute to the society as responsible civic conscious members of the society and to be gender sensitive</p> <p>PO4: Analyse political and policy issues and build capacities to articulate policy options</p> <p>PO5: Demonstrate critical thinking, including the ability to form an argument about key concerns of political theory and issues of public policy and politics</p> <p>PO6: Understand the relations between nations of the world</p> <p>PO7: Promote participation in the global world for better living.</p> <p>PO8: Demonstrate the need for global leadership</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO 1: Discuss the major theories and concepts of political science and its subfields</p> <p>PSO 2: Distinguish systematic normative inquiry from Behavioural kinds of inquiry within the discipline of political science</p> <p>PSO 3: Demonstrate the ability to apply abstract theory to concrete problems by using the ideas of political theorists to address contemporary political issues</p> <p>PSO 4: Assess the origin and evolution of conceptual framework of political theory and Political Institutions</p> <p>PSO 5: Demonstrate the inter-connection between Liberty, Equality, Justice and Democratic ethos</p> <p>PSO 6: Discuss the major theories and concepts of political science and its subfields</p> <p>PSO 7: Distinguish systematic normative inquiry from Behavioural kinds of inquiry within the discipline of political science</p> <p>PSO 8: Demonstrate the ability to apply abstract theory to concrete problems by using the ideas of political theorists to address contemporary political issues</p>	
<b>Semester- I</b>	
<b>Subject and code: Basic Concepts in Political Science G 103 DC1.1</b>	
<b>Course Outcomes:</b>	
CO1. To introduce students to the concepts, categories, theories, and constructs of Political	

<p>Science</p> <p>CO2. To inculcate among students the values and essentials of responsible and active citizenship.</p> <p>CO3. To enable students to comprehend the values and principles underlying political order and to reflect constructively on the issues of governance.</p> <p>CO4. To enable students to understand the interface between politics and society, and the complexities in political choices.</p>
<b>Subject and code: Political Theory G 103 DC2.1</b>
<b>Course Outcomes:</b>
<p>CO1. To introduce the students to the concepts and constructs in political theory.</p> <p>CO2. To enable students to evolve a comparative perspective on ideas and ideologies.</p> <p>CO3. To help students understand the politico-normative issues with conceptual clarity and to apply it in practice.</p> <p>CO4. To equip students to handle complex and abstract arguments in political theory.</p>
<b>Subject and code: OE - INDIAN POLITY: ISSUES AND CONCERNS</b>
<b>Course Code: G 103 OE1.1</b>
<b>Course Outcomes:</b>
<p>CO1. To enable students to grasp the complex relationship/ linkages between politics and society.</p> <p>CO2. To comprehend the dynamics and forces at work in shaping the political process.</p> <p>CO3. To enable students to recognize the nature and trends in Indian politics.</p> <p>CO4. To enable students to identify and critically reflect on the major issues confronting Indian politics.</p>
<b>Semester- II</b>
<b>Subject and code: WESTERN POLITICAL THOUGHT</b>
<b>Course Code: G 103 DC1.2</b>
<b>Course Outcomes:</b>
<p>CO1: To familiarise students with western foundations of political thought and critically engage with the rational and/or material universe of the west.</p>

- CO2. To identify and evaluate the changes and continuity in western political thought
- CO3. To expose students to the divergent perspectives on politics, state and its arrangements within the western political tradition
- CO4. To create an understanding among students on western engagements with issues of governance and political order

**Subject and code : INDIAN NATIONAL MOVEMENT AND CONSTITUTIONAL DEVELOPMENT**

**Course Code: G 103 DC2.2**

**Course Outcomes:**

- CO1. To endow students with a historical perspective on the rise and growth of nationalism and the making of the Indian Constitution.
- CO2. To enable students to comprehend the influence of diverse perspectives and values articulated during the national movement that influenced the making of the Indian political system.
- CO3. To enable students to understand the milestones, contestations and settings that shaped the Indian political system.
- CO4. To help students to understand the motives and visions of Constitution-makers in the incorporation of novel aspects in the Indian Constitution.

**Subject and code : OE - Title: LEGAL LITERACY IN INDIA**

**Course Code: G 103 OE1.2**

**Course Outcomes:**

- CO1: Provide essential knowledge on general principles of law, get acquainted with the nature and sources of law, relation of law with human and institutional agencies responsible to ensure just, equitable and secure environment for the protection of human rights, liberty and balancing the interests of the individuals and society at large.
- CO2. Locate criminal justice system, civil procedure code, various family laws, laws relating contract and property

### Semester- III

**Subject and code: INDIAN GOVERNMENT AND POLITICS**

**Course Code: G 103 DC1.3**

**Course Outcomes:**

- CO1: To provide students an understanding of the functioning of the Indian Government

and Politics.

CO2. To make students understand the philosophy of Indian constitution and its commitment towards citizens.

CO3. To provide students necessary knowledge to assess the performance of the Union and state governments.

CO4. To help students to develop interest in politics and grasp the dynamics/nuances of the politics, leadership and the role of socio-economic, religious and lingual issues.

**Subject and code: PARLIAMENTARY PROCEDURES IN INDIA**

**Course Code: G 103 DC2.3**

**Course Outcomes:**

CO1: To provide a basic understanding of the parliamentary system of governments and the constitutional provisions relating to the parliamentary procedures in India.

CO2. To familiarise students with the legislative procedures and practices in India.

CO3. To impart the students adequate skills for participation in deliberative processes and democratic decision making.

CO4. To enable students to understand the working of democracy through an institutional mechanism.

**Subject and code: OE - READING GANDHI**

**Course Code: G 103 OE1.3**

**Course Outcomes:**

CO1. To enable students to understand the core elements of Gandhian thought and Gandhi's approach to the key issues of contemporary India.

CO2. To familiarise students on the Gandhian ideas on wide range of issues including politics, economics, social reconstruction, religion and issues of sustainable development.

CO3. To acquaint the students on the ideas of Gandhi on social relations and issues.

CO4. To assess the relevance of Gandhi on the current political discourses through the analysis of his ideas on modern society, Swadeshi etc

#### **Semester- IV**

**Subject and code: ANCIENT INDIAN POLITICAL IDEAS AND INSITUTIONS**

**Course Code: G 103 DC1.4**

<b>Course Outcomes:</b>
<p>CO1. To provide students an understanding of the social and political philosophy of ancient India.</p> <p>CO2. To facilitate assessment of modern notions on socio-political arrangements in the background of the study of Ancient India.</p> <p>CO3. To enable critical reflection and to de-colonise the mind-set related to India's past.</p> <p>CO4. To focus and develop indigenous political theories relevant to changing times.</p>
<p><b>Subject and code: MODERN POLITICAL ANALYSIS</b></p> <p><b>Course Code: G 103 DC2.4</b></p>
<b>Course Outcomes:</b>
<p>CO1: To equip students to understand the functioning of political institutions with a insights on both normative and empirical ways of understanding.</p> <p>CO2. To enable students to grasp and evaluate the value laden and value neutral aspects of government functioning.</p> <p>CO3. To enable students to scientifically assess the functioning of the governments as result oriented institutions.</p> <p>CO4. To familiarise students with the process of decision making in political institutions.</p>
<p><b>Subject and code: OE- POLITICAL JOURNALISM</b></p> <p><b>Course Code: G 103 OE1.4</b></p>
<b>Course Outcomes:</b>
<p>CO1. To equip students to develop insights into political reporting.</p> <p>CO2. To grasp the essentials of writing skills backed by proper use of grammar and economy of words.</p> <p>CO3. To provide a broad overview of the nuances of interpreting the political phenomena from grassroots to the Parliament.</p> <p>CO4. To consider seriously Media as a career option.</p>
<b>Semester- V</b>
<b>Subject and code: INTERNATIONAL RELATIONS 103.5a</b>
<b>Course Outcomes:</b>
<p>CO1: Indicate the extent and importance of the study of International Relations</p> <p>CO2: Apply mathematical models to the study of International Relations</p> <p>CO3: Discuss the limitations of national power</p> <p>CO4: Locate and explain the realm of diplomacy</p>

CO5: Discuss the dynamics of Cold War politics and promote the understanding on the need for disarmament
CO6: Assess the Emerging Centres of power in the World today
<b>Subject and code: PUBLIC ADMINISTRATION G 103.5b</b>
<b>Course Outcomes:</b>
CO1: Distinguish between the public administration and private administration. CO2: Organise the journey of discourse in public administration for ex: how the old public administration view was contested by the idea of new public administration CO3: Explain the attributes of Development Administration CO4: Analyse Personnel Administration and demonstrate the need for capacity building and training. CO5: Define and describe Financial Administration and Gendering of Budget
<b>Subject and code: POLITICAL SOCIOLOGY G 103.5c</b>
<b>Course Outcomes:</b>
CO1: Explain and draw the emerging perspectives on Political Sociology and Political Socialization CO2: Describe Political Participation, Political Culture, and Political Apathy CO3: Organise the trends in Modernity & Post Modernity CO4: Describe the trends in Nationalism, Secularism, Communalism, Regionalism and Women Movements CO5: Discuss and arrange the components of Civil Society Organization and indicate the need for Right to information
<b>Semester- VI</b>
<b>Subject and code: INTERNATIONAL POLITICS G 103.6a</b>
<b>Course Outcomes:</b>
CO1: Describe the recent developments in the International Bodies. CO2: Identify the activities of the International Bodies CO3: Identify the complexities of changing International Politics CO4: Describe the need for reform of the Security Council CO5: Demonstrate the conceptions of Soft Power and India's Foreign Policy CO6: Indicate the contours Foreign Policy of the US and to review the policy of Convergence in South Asia
<b>Subject and code: FUNDAMENTALS OF MANAGEMENT 103.6b</b>
<b>Course Outcomes:</b>
CO1: Discuss and draw the functions and principles of management CO2: Demonstrate the skills of Developing Excellent Managers CO3: Correlate the various schools of Management Thought

<p>C04: Review the limitations of Planning and Techniques of Control</p> <p>C05: Develop leadership skills and to assess employee motivation and comprehend corporate strategy</p> <p>C06: Describe the need for valuing diversity, its dimensions and attitudes</p>
<b>Subject and code: LEADERSHIP G 103.6</b>
<b>Course Outcomes:</b>
<p>CO1: Describe the need for Traditional, Legal-rational, Charismatic, Authoritarian and Democratic Leadership</p> <p>CO2: Define and explain Political, Civic, literary, and Cultural Leadership</p> <p>CO3: Explain the importance of spiritual leadership</p> <p>CO4: Describe different mores of leadership</p> <p>CO5: Define and describe corporate leadership and labour leadership</p>

<b>Department Name: G100 C</b>	<b>ENGLISH MAJOR</b>
<b>PROGRAMME OUTCOMES</b>	
<p>CO1: Students are introduced to various literatures from across the world alongside a survey of canonical British writers</p> <p>CO2: They are introduced to concepts of colonialism, post colonialism, nativism, culturalism and identity</p> <p>CO3 :They are introduced to various critical and theoretical approaches to help them develop their critical thinking abilities</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO1: Knowledge of British social and cultural history through introduction to canonical texts of British literature</p> <p>PSO2: Understanding of diverse cultural contexts of different nations, geographies and people through selected texts of renowned authors</p> <p>PSO3: Understanding of Modernism through introduction to relevant texts of prose, poetry, drama and fiction of the 20th century</p> <p>PSO4: Knowledge of concepts such as nation, nationalities, race and civilization through introduction to selected texts from the period of Indian nationalist struggle</p> <p>PSO5: Knowledge of concepts like colony, colonization and Postcolonialism through historical understanding of relevant texts</p> <p>PSO6: Understanding the concept of literary criticism and literary theory. Knowledge of various theories necessary for interpretation of texts</p> <p>PSO7: Introduction to concepts and theories of culture, ideologies of culture and critical analysis of cultural aspects represented in literature</p> <p>PSO8: Understanding concepts of gender, sexuality, hetero-normativity, patriarchy, sexism, gender relations and embodiment.</p>	

Semester- I
<b>Subject and code: Introduction to Literature G 108 DC 1.1</b>
<b>COURSE OUTCOMES</b>
CO1: To introduce students to the major works of English literature. CO2: To understand different periods in the history of English literature. CO3: To understand works in different genres of literature. CO4: To introduce students to Literature from various regions of the world.
<b>Subject and code: Indian Writing in English - Part I G 108 DC 2.1</b>
<b>COURSE OUTCOMES</b>
CO1: To give an understanding of social and cultural contexts across the world. CO2: To bring a global perspective on literature CO3: To understand the beginnings of Modernism.. CO4: To explore the realms of Literary Modernism in English literature.
Semester- II
<b>Subject and code: Introduction to Phonetics and Linguistics G 108 DC 1.2</b>
<b>COURSE OUTCOMES</b>
CO1: To understand the different movements and literary styles associated with modernism. CO2: To understand concepts of colonialism, postcolonialism, neo-imperialism CO3: To analyze the social, political and historical impact of colonization and native responses to it CO4: To study structures of power underlying colonialism, nativism CO5: To understand the impact of colonization on language
<b>Subject and code: Indian Writing in English - Part II G 108 DC 2.2</b>
<b>COURSE OUTCOMES</b>
CO1: To examine literary works, theatre and films from a postcolonial perspective CO2: To trace the changing approaches to literary studies CO3: To give an understanding of the philosophical background of ancient western classical criticism CO4: To chart the transition from literary criticism to theory CO5: To give an overview of modern critical practices
Semester- III
<b>Subject and code : British Literature Upto 1800 G 108 DC 1.3</b>
<b>COURSE OUTCOMES</b>
CO1: To explore concepts of Nationalism/Nation, Colonization, Gender, Caste CO2: To understand the socio-historical background of anti-colonial nationalism CO3: To locate current discourse of cultural nationalism in late Nineteenth century Social Reform Movement

CO4: To study autobiographical, literary works, plays, fiction written in response to nationalism, partition and post-colonial nation-state
<b>Subject and code: Indian Writing in Translation G 108 DC 2.3</b>
<b>COURSE OUTCOMES</b>
CO1: To understand the distinction between symbolic culture and culture as lived practice CO2: To explore cultural identities of race, class, gender and nation in literary texts
<b>Semester- IV</b>
<b>Subject and code: British Literature – 1800 &amp; after G 108 DC 1.4</b>
<b>COURSE OUTCOMES</b>
CO1: To understand the historical evolution of the meanings of culture CO2: To understand the distinction between symbolic culture and culture as lived practice CO3: To explore cultural identities of race, class, gender and nation in literary texts CO4: To examine cultural signifiers in visual and literary texts
<b>Subject and code: Gender Studies G 108 DC 2.4</b>
<b>COURSE OUTCOMES</b>
CO1: To understand the concept of gender as a social construct CO2: To examine the ideological underpinnings of masculinity, femininity CO3: To analyse the alternate nature of sexuality CO4: To examine the ways in which gender intersects with different categories such as class, race, nation
<b>Semester- V</b>
<b>Subject and code: INTRODUCTION TO LITERARY THEORY AND PRACTICE</b>
<b>COURSE OUTCOMES</b>
CO1: Appropriate use of collocations, Phrasal verbs and Tense forms CO2: Report Writing – Business Report, Writing Minutes of meetings CO3: Framing ‘Wh’ Questions, Use of Active and Passive voice, Direct and Indirect speech CO4: Critical thinking through analyzing a Cartoon
<b>Subject and code: INTRODUCTION TO AMERICAN LITERATURE</b>
<b>COURSE OUTCOMES</b>
CO1: To understand the historical evolution of the meanings of culture CO2: To understand the distinction between symbolic culture and culture as lived practice CO3: To explore cultural identities of race, class, gender and nation in literary texts

CO4: To examine cultural signifiers in visual and literary texts
<b>Semester- VI</b>
<b>Subject and code: INTRODUCTION TO POSTCOLONIAL LITERATURE</b>
<b>COURSE OUTCOMES</b>
CO1: To understand the historical evolution of the meanings of culture CO2: To understand the distinction between symbolic culture and culture as lived practice CO3: To explore cultural identities of race, class, gender and nation in literary texts CO4: To examine cultural signifiers in visual and literary texts
<b>Subject and code: INTRODUCTION TO MODERNISM AND POSTMODERNISM</b>
<b>COURSE OUTCOMES:</b>
CO1: To understand the historical evolution of the meanings of culture CO2: To understand the distinction between symbolic culture and culture as lived practice CO3: To explore cultural identities of race, class, gender and nation in literary texts CO4: To examine cultural signifiers in visual and literary texts

<b>Department Name:</b>	<b>G 100 D SOCIOLOGY</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO 1: The students acquire knowledge in the field of social sciences, literature and humanities which make them sensitive and sensible.</p> <p>PO 2: The B.A. graduates will be acquainted with the global social, economical, historical, geographical, political, ideological and philosophical tradition and thinking.</p> <p>PO 3: The programme empowers and thoroughly prepares the graduates to appear for various competitive examinations or choose the post graduate programmes of their choice.</p> <p>PO 4: The programme enables the students to acquire knowledge with human values framing the base to deal with various problems in life with courage and humanity.</p> <p>PO 5: The students will be ignited enough to critically think and act over for solution to various issues prevailing in human life to make this world a better place.</p> <p>PO 6: The programme provides a holistic base for every student to become a responsible citizen.</p>	

<b>PROGRAMME SPECIFIC OUTCOMES</b>
<p>PSO1: Demonstrate knowledge of fundamental theoretical approaches and core disciplinary concepts.</p> <p>PSO2: Understand sociological phenomena, social structures, social institutions, cultural practices, and multiple axes of difference and/or inequality.</p> <p>PSO3: Understand the Indian society, both the rural and urban communities, and the institutions therein with their complex functioning.</p> <p>PSO4: Possess knowledge of the history and evolution of the industrial society and its functioning in current times.</p> <p>PSO5: Develop an ability to use social scientific research methods to address sociological questions and exhibit critical thinking skills in evaluating sociological research, including the background assumptions, appropriateness of methods used and the strength of explanatory evidence.</p> <p>PSO6: Possess knowledge and analyse various social problems engulfing India and suggest remedies for the same.</p> <p>PSO7: Demonstrate the ability to use several of the major classical or contemporary perspectives in social theory and apply the same in contemporary society.</p> <p>PSO8: Understand the current social welfare programmes in India and their importance for the growth and progress of India keeping the vulnerable groups in mind.</p>
<b>Semester- I</b>
<p><b>Subject and code: Understanding Sociology</b>  <b>code: G 104 DC1.1</b></p>
<b>COURSE OUTCOMES</b>
<p>CO1: Understand the discipline of Sociology</p> <p>CO2: Trace the origin of Sociology</p> <p>CO3: Analyse the relevance of Sociology in contemporary times</p> <p>CO4: Describe the fundamental theoretical approaches</p> <p>CO5: Apply the theories to conceptualize a sociological problem</p> <p>CO6: Understand the specialized branches of Sociology and various career opportunities</p> <p>CO7: Analyse the importance of the specialized branches of Sociology in the global context</p> <p>CO8: Understand the sociological thinking of the founders of Sociology.</p> <p>CO9: Understand the concept of culture</p> <p>CO10: Explain the process of socialization</p> <p>CO11: Apply socialization in the daily social lives</p> <p>CO12: Comprehend the uniqueness of sociological imagination in the study of society</p> <p>CO13: Impart critical thinking to interpret the social scenario.</p>
<p><b>Subject : CHANGING SOCIAL INSTITUTIONS IN INDIA</b>  <b>CODE: G 104 DC2.1</b></p>

<b>COURSE OUTCOMES</b>
CO1. Understand the nature of inequalities in the society CO2. Learn the dynamics of social groupings and discrimination CO3. Understand the ideologies behind social stratification and mobility. CO4. The modes of social improvement people use CO5. Assess the reservation policy and its implications. CO6. Learn the nature of social mobility CO7. Identify the new forms taken by institutions of family and marriage CO8. Examine the relationship between religion and science
<b>Subject :Indian Society: Continuity and Change</b> <b>Code : G 104 OE1.1</b>
<b>COURSE OUTCOMES</b>
CO1. Understand social issues and problems of contemporary India. CO2. Change agents - governmental and non-governmental organizations. CO3. Structural linkages and interrelationships of social issues. CO4. Emerging social issues and problems of contemporary India CO5. Sociological understanding of issues and problems CO6. Empower to deal with issues and problems CO7. Better understanding of their own situation and region.
<b>Semester- II</b>
<b>Subject : Foundations of Sociological Theory</b> <b>Code: G 104 DC1.2</b>
<b>COURSE OUTCOMES</b>
CO1. Understand the emergence of Sociology. CO2. Know the foundations of Sociology. CO3. Understand the contributions of early sociologists. CO4. Impart critical thinking CO5. Inculcate analytical ability to interpret the social scenario. CO6. Understand the forces in the rise of sociological theory. CO7. Understand the concepts of early sociologists
<b>Subject : Sociology of Rural Life in India</b> <b>Code : G 104 DC2.2</b>
<b>COURSE OUTCOMES</b>
CO1. Analyze rural problems in India CO2. Knowledge of rural governance. CO3. Skills to reconstruct rural institutions and rural development. CO4. Sociological understanding of society in India CO5. Basic concepts in rural studies CO6. Development programmes to plan, monitor and evaluate. CO7. Understanding of the linkages between urban and rural reality
<b>Subject : Society through Gender</b> <b>Code: G 104 OE1.2</b>

<b>COURSE OUTCOMES</b>
CO1. Understand gender determination and gender roles. CO2. Analyse gendered nature of major social institutions CO3. Understand the challenges to gender inequality CO4. Theories of gender relation in Indian society. CO5. Gender as a category of social analysis. CO6. Basic concepts of gender and gender inequality CO7. Gendered nature of major social institutions CO8. Social construction of gender and gender roles CO9. Identify gender bias and discrimination in everyday social interaction
<b>Semester- III</b>
<b>Subject : Social Stratification and Mobility</b> <b>Code : G 104 DC1.3</b>
<b>COURSE OUTCOMES</b>
CO1. Understand the meaning of social stratification CO2. Examine forms of stratification, understand the relevance of caste, class and estate in contemporary world. CO3. Inculcate a truly inter-disciplinary approach in the study of society especially stratification in all its manifestations. CO4. Identify different perspectives on stratification CO5. Analyse social mobility and changing patterns in India
<b>Subject : Sociology of Urban Life in India</b> <b>Code : G 104 DC2.3</b>
<b>COURSE OUTCOMES</b>
CO1 Understand urban sociology and the changing structure CO2 Acquaint with various perspectives on urban sociology CO3 Exposure to urban policies and planning
<b>Subject : Sociology of Tourism Management</b> <b>Code : G 104 OE1.3</b>
<b>COURSE OUTCOMES</b>
CO1. Basic knowledge on tourism, culture and tourist CO2. Understand social aspects of tourism CO3. Understanding tourism as a socio-economic force in social development. CO4. Understanding cultural differences and respect for others culture. CO5. Analyze tourism management and its changing trends
<b>Semester- IV</b>
<b>Subject : Sociology of Marginalised Groups</b> <b>Code: G 104 DC1.4</b>
<b>COURSE OUTCOMES</b>
CO1. Focus on the neglected segments of the population CO2. Sociological study on causes of marginalization CO3. Knowledge on communities in extreme poverty, deprivation and discrimination

CO4. Enable to locate marginality of major communities which is deeply embedded in Indian social structure

CO6. Understand nature of emerging global social exclusion and social change

**Subject : Population and Society**

**Code: G 104 DC2.4**

**COURSE OUTCOMES**

CO1: Understand population and society

CO2: Acquaint with the global population trends

CO3: Knowledge of sources of demographic data

CO4: Analyse population as a constraint and development for society and examine the theories, policy and programmes

**Subject : Sociology of Leisure**

**Code: G 104 OE1.4**

**COURSE OUTCOMES**

CO1. Knowledge of leisure and its types

CO2. Analyse constraints on leisure participation

CO3. Familiarize with commodification of leisure

**Semester- V**

**Subject and Code: G. 104.5a SOCIAL PROBLEMS IN INDIA**

**COURSE OUTCOMES**

CO 1: Understand the concept of social problems

CO 2: Examine the causes of social problems

CO 3: Apply theoretical approaches to understand social problems

CO 4: Explain family disorganization

CO 5: Analyse the causes and effects of family disorganization

CO 6 : Propose solutions to family disorganization

CO 7: Understand crime and juvenile delinquency and their causes

CO 8: Explain the various theories of punishment

CO 9: Examine the preventive, reformatory and rehabilitation measures

CO 10: Explain alcoholism and drug addiction

**Subject and Code: G. 104.5b: RESEARCH METHODOLOGY**

**COURSE OUTCOMES**

CO 1: Understand social research

CO 2: Examine the problems in social research

CO 3: Describe the steps in social research

CO 4: Apply research designs

CO 5: Differentiate between types of sources of data

CO 6: Describe sampling

CO 7: Apply various techniques of sampling

CO 8: Describe observation as a method of data collection

CO 9: Describe questionnaire as a method of data collection

CO 10: Create a questionnaire

Semester- VI	
<b>Subject and Code: G. 104. 6a: SOCIOLOGICAL THOUGHT AND MODERN THEORIES</b>	
<b>COURSE OUTCOMES</b>	
CO 1: Understand Sociological thought CO 2: Differentiate between social thought and sociological thought CO 3: Analyse the transition from Social philosophy to Sociology CO 4: Describe the contributions of early sociological thinkers like Comte, Spencer, Durkheim, Weber and Marx. CO 5 : Critically examine theories of the early Sociological thinkers CO 6: Apply the early theories in the present times CO 7: Explain the growth of modern sociological theories CO 8 : Analyse the theories of modern thinkers like Parsons, Merton, Coser, Mead and Blumer CO 9: Critically examine the modern theories in Sociology and analyse their significance and interdisciplinary application	
<b>Subject and Code: G. 104.6b: SOCIAL POLICY AND WELFARE IN INDIA-</b>	
<b>COURSE OUTCOMES</b>	
CO 1: Understand the concept of social policy and social welfare CO 2: Examine the agencies of social welfare, both government and non-government agencies CO 3: Describe civil society CO 4: Describe the National Policy for Children CO 5: Examine the various programmes for welfare of children CO 6: Understand children in conflict with law CO 7: Analyse child labour and the problem of the girl child CO 8: Describe the National Youth Policy CO 9: Describe youth programmes CO 10: Analyse the importance of youth and sports CO 11: Understand the problems of women CO 12: Examine the various government policies and programmes for women CO 13: Analyse violence against women	

<b>Department Name:</b>	<b>G 100 E JOURNALISM</b>

<b>PROGRAMME OUTCOMES</b>
<p>PO 1: Develop Graduates with basic understanding on various media and communication practices and its importance in contemporary society</p> <p>PO 2: Enhancement of skills in various Media production techniques and to be industry ready</p> <p>PO 3: Develop and apply scientific approach to meet the needs of the society and to produce responsible and creative media professionals</p>
<b>PROGRAMME SPECIFIC OUTCOMES</b>
<p>PSO 1: Gain knowledge on various communication patterns</p> <p>PSO 2: Acquire skills of journalistic practices</p> <p>PSO 3: Recognizing Media as a important information and education tool</p> <p>PSO 4: Equipped with various media technologies</p> <p>PSO 5: Creation of innovative media content</p> <p>PSO 6: Ability to enquire and respond to various social issues and concerns through media practices</p> <p>PSO 7: Develop skills to analyze media content with a critical bent of mind</p> <p>PSO 8: Get hands on experience in media field through internships and media campaigns</p> <p>PSO 9: Create socially responsible media practitioners</p>
<b>Semester- I</b>
<b>Subject and code: Introduction to Journalism G 105 DC1.1</b>
<b>Course Outcomes:</b>
<p>CO1: Understand and appreciate various dimensions of mass communication</p> <p>CO2: Develop an understanding of the fundamental concepts of Journalism</p> <p>CO3: Analyse the scope and various dimensions in Journalism</p> <p>CO4: Discuss the recent trends in Mass Media</p>
<b>Subject and code: Practical- Journalistic writing skills G 105 DC2.1P</b>
<b>Course Outcomes:</b>
<p>CO1: Understand and appreciate various dimensions of mass communication</p> <p>CO2: Develop an understanding of the fundamental concepts of Journalism</p> <p>CO3: Analyse the scope and various dimensions in Journalism</p> <p>CO4: Discuss the recent trends in Mass Media</p>

<b>Subject and code: WRITING FOR MEDIA G 105 OE1.1</b>
<b>Course Outcomes:</b>
CO1: To make them familiar with writing for media and develop interest in writing CO2: Introduce the students to cultivating of sources CO3: Equip the students with new trends in media writing
<b>Semester- II</b>
<b>Subject and code: COMPUTER APPLICATIONS FOR MEDIA G 105 DC1.2</b>
<b>Course Outcomes:</b>
CO1: Understand the basic concepts of computers CO2: Develop and understanding of the applications of computers in print and electronic journalism CO3: Apply Information Technology skills in print and Broadcast projects. CO4: Demonstrate web-based broadcasting skills
<b>Subject and code: Practical- BASIC MULTIMEDIA SKILLS G 105 DC2.2P</b>
<b>Course Outcomes:</b>
CO1. Creating Power Point Presentation using Multimedia tools CO2. Designing an e-paper page using QuarkXPress/InDesign CO3. Creating Infographics CO4. Record content of your choice using audio-recording software CO5. Creating Multimedia Content-News stories and Feature stories CO6. Podcast
<b>Subject and code: PHOTO JOURNALISM : G 105 OE1.2</b>
<b>Course Outcomes:</b>
CO1: To attract students toward Photojournalism CO2: To familiarize the students to techniques of photography and photojournalism CO3: To give a practical knowledge in the field of Photography
<b>Semester- III</b>

<b>Subject and code: News Reporting and Analysis</b> G 105 DC1.3
<b>Course Outcomes:</b>
CO1:Organize and articulate new stories understanding the concepts, structure, and types of news. CO2: Evaluate and analyse the importance of sources and types of information that provide the basis for news stories. CO3: Formulate skills for news selection, processing, prioritizing and finally, designing the end-product, CO4: Identify the basic ethical issues confronting editors and can practice fair play.
<b>Subject and code: Practical - -News Reporting and Analysis</b> <b>G 105 DC2.3P</b>
<b>Course Outcomes:</b>
CO1:Organize and articulate new stories understanding the concepts, structure, and types of news. CO2: Evaluate and analyse the importance of sources and types of information that provide the basis for news stories. CO3: Formulate skills for news selection, processing, prioritizing and finally, designing the end-product, CO4: Identify the basic ethical issues confronting editors and can practice fair play.
<b>Subject and code: Feature Writing and Freelancing G 105 OE1.2</b>
<b>Course Outcomes:</b>
CO1: Organize and articulate competent feature stories understanding the concepts, structure, and types of features. CO2: Write different types of feature stories and get published. CO3: The students should turn into serious free lancers understanding ups and downs in the freelancing.
<b>Semester- IV</b>

<b>Subject and code: News Processing and Editing G 105 DC1.4</b>
<b>Course Outcomes:</b>
CO1: Understand the hierarchy of editorial department and the role of editors. CO2: Edit copy precisely and consistently, using correct grammar and eliminating libelous passages and items in poor taste. CO3: Be able to write clear and accurate headlines, decks, and captions. CO4: Be able to design basic news pages. Understand the basic ethical issues confronting editors.
<b>Subject and code: Practical -News Processing and Editing G 105 DC2.4P</b>
<b>Course Outcomes:</b>
CO1: Understand the hierarchy of editorial department and the role of editors. CO2: Edit copy precisely and consistently, using correct grammar and eliminating libelous passages and items in poor taste. CO3: Be able to write clear and accurate headlines, decks, and captions. CO4: Be able to design basic news pages. Understand the basic ethical issues confronting editors.
<b>Subject and code: Translation for Media G 105 OE1.4</b>
<b>Course Outcomes:</b>
CO1: Translate the given stories keeping in mind the requirements of the client. CO2: Understand the difference between translations for different media and practice it. CO3: Gain a mastery over the techniques of translation.
<b>Semester- V</b>
<b>Subject and code: G 105.5(a) FILM STUDIES</b>
<b>Course Outcomes:</b>
CO 1: Understand the film language and acquire ability to appreciate films. CO 2: Obtain knowledge about major film movements and genres.

CO 3: Acquire basic skills in production and analysis of films
CO 4: Recognize the role and contemporary status of cinema in society.
<b>Subject and code : G 105.5(b) VI- ADVERTISING AND PUBLIC RELATIONS</b>
<b>Course Outcomes:</b>
CO 1: Understand basic laws related to media
CO 2: Acquire an understanding of the nature of ethics in journalism
CO 3: Analyze the recent amendments in media law with case studies
CO 4: Form students as responsible media persons
<b>Semester- VI</b>
<b>Subject and code: MEDIA LAWS AND ETHICS</b>
<b>Course Outcomes:</b>
CO 1: Comprehension of the basics of managerial practices in an organization.
CO 2: Ability to evaluate various types, aspects of media business, issues and challenges in global media
CO 3: Identify different communication policies and recommendations of major media committees
CO 4: Explore organizational patterns of Indian media and entertainment industry and understand their future scope.
<b>Subject and code: G 105.6(b) Media Management</b>
<b>Course Outcomes:</b>
CO 1: Comprehension of the basics of managerial practices in an organization.
CO 2: Ability to evaluate various types, aspects of media business, issues and challenges in global media
CO 3: Identify different communication policies and recommendations of major media committees
CO 4: Explore organizational patterns of Indian media and entertainment industry and understand their future scope.

<b>Department Name:</b>	<b>G 100 G SOCIAL WORK</b>
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<b>PROGRAMME OUTCOMES</b>
<p>PO 1 : Empowerment of graduates with professional attitude and behavior</p> <p>PO 2 : Apply scientific knowledge and acquire effective communication skills in professional commitment</p> <p>PO 3 : Develop and engage scientific approach to meet human needs and identify them as social change maker towards transformation</p>
<b>PROGRAMME SPECIFIC OUTCOMES</b>
<p>PSO 1 : Able to uphold values and ethics of Social Work</p> <p>PSO 2 : Able to perform diverse roles in various social work settings</p> <p>PSO 3 : Able to work effectively in team environment.</p> <p>PSO 4 : Skilled to communicate effectively working with individuals</p> <p>PSO 5 : skilled to communicate effectively working with Groups</p> <p>PSO 6 : skilled to communicate effectively working with Communities</p> <p>PSO 7 : Demonstrate the spirit of volunteerism to reach out disadvantaged sections of the society.</p> <p>PSO 8 : Able to assess and intervene with the individuals, families, groups, organizations and communities</p> <p>PSO 9 : Develop zeal and enthusiasm to work within the framework of existing structure (Governmental and Nongovernmental)</p>
<b>Semester- I</b>
<b>Subject and code: Foundations for Social Work - G 111 DC1.1:</b>
<b>Course Outcomes:</b>
<p>CO1:To understand history and evolution of social work profession, both in India and the West</p> <p>CO2:To develop insights into the origin and development of ideologies and approaches to social Change.</p> <p>CO3: To develop Skills to understand contemporary reality in its historical context</p>
<b>Subject and code: : Social work Field Practicum 1 - G 111 DC2.1P</b>
<b>Course Outcomes:</b>
<p>CO1: To understand the basics of fieldwork, concept of self and fieldwork and the professional role of social workers.</p> <p>CO2: To critically understand and appreciate programmes and projects of governmental</p>

and on-governmental organizations.
CO3: To enhance importance of skills in report writing and documentation
<b>Subject and code: Fields of Social Work Practice G 111 OE1.1:</b>
<b>Course Outcomes:</b>
CO1: To understand the fields of social work
CO2: To know the different settings of social work To understand the competencies required to work in different settings of social work.:
CO3: To critically understand and appreciate programmes and projects of governmental and on-governmental organizations.
<b>Semester- II</b>
<b>Subject and code: Social Case Work G 111 DC1.2:</b>
<b>Course Outcomes:</b>
CO1: To understand the individual, family and their problems and the social contextual factors affecting them
CO2:To understand Social Casework as a method of Social Work practice
CO3:To gain knowledge about the basic concepts, tools, techniques, processes and skills of working with individuals
CO4:To develop an understanding of application of case work in diverse settings
<b>Subject and code: Social Work Field Practicum-2 G 111 DC 2.2P</b>
<b>Course Outcomes:</b>
CO1:To understand the basics of fieldwork, concept of self and fieldwork and the professional role of social workers.
CO2:To critically understand and appreciate programmes and projects of governmental and non-governmental organizations.
CO3: To enhance importance of skills in report writing and documentation
<b>Subject and code: Social Work Concerns for Women and Child Development G 111 OE2.2:</b>
<b>Course Outcomes:</b>
CO1: To understand Social Work concerns for Women Development.

CO2: To understand Social Work concerns for child Development
CO3: To enhance social work practice with women and child development
<b>Semester- III</b>
<b>Subject and code: Social Group Work G 111 DC1.3</b>
<b>Course Outcomes:</b>
CO1. To understand the nature and types of groups
CO2. To understand Social Group Work as a method of Social Work practice
CO3. To know the basic concepts, tools, techniques, processes and Skills of working with groups
CO4. To develop an understanding of the process of group development and group dynamics
CO5. To develop an understanding of application of group work in diverse settings
<b>Subject and code: Social Work Field Practicum 3 G 111 DC2.3P</b>
<b>Course Outcomes:</b>
CO1. To gain experience of working with the people at individual, intra- group, community and organizational levels
CO2. To critically understand and appreciate programmes and projects of the field work agency.
CO3. To enhance importance of skills in report writing and documentation.
<b>Subject and code: Social Development and Sustainable Development G 111 OE 1.3</b>
<b>Course Outcomes:</b>
CO1. To gain experience of working with the people at individual, intra- group, community and organizational levels
CO2. To critically understand and appreciate programmes and projects of the field work agency.
CO3. To enhance importance of skills in report writing and documentation.
<b>Semester- IV</b>

<b>Subject and code: Community Organization and Social Action</b> <b>G 111 DC1.4</b>
<b>Course Outcomes:</b>
CO1. To equip with different approaches in Community Organization and Community development programs and Social Action. CO2. To develop an attitude and skills for participatory process. CO3. To provide students an opportunity to learn hands –on through field work experience.
<b>Subject and code: Social Work Field Practicum 4</b> <b>G 111 DC2.4P</b>
<b>Course Outcomes:</b>
CO1. To gain experience of working with the people at individual, intra-group, community and organizational levels CO2. To critically understand and appreciate programmes and projects of the field work agency. CO3. To enhance importance of skills of recording and documentation through report writing.
<b>Subject and code: Disaster Management: Preparedness and Response</b> <b>G 111 OE 2.4</b>
<b>Course Outcomes:</b>
CO1. To provide basic conceptual understanding of disasters and its relationships with development. CO2. To gain understand approaches of Disaster Risk Reduction (DRR) and the relationship between vulnerability, disasters, disaster prevention and risk reduction. CO3. To provide broad understanding about the basic concepts of Disaster Management
<b>Semester- V</b>
<b>Subject and code: G111.5a: SOCIAL WORK WITH FAMILIES</b>
<b>Course Outcomes:</b>
CO1: To know Family dynamics, its functioning and Interventions. CO2: To study the issues and Interventions of Children ,Youth and Elderly

<b>Subject and code: G111.5b: SOCIAL WELFARE ADMINISTRATION</b>
<b>Course Outcomes:</b>
CO1: Develop an understanding of basic concepts of administration in Social Work practice CO2: Develop ability to apply basic principles of Social Welfare administration to agency functioning
<b>Subject and code: SOCIAL WORK FIELD PRACTICUM</b>
<b>Course Outcomes:</b>
CO1: To offer purposeful learning, experience to students through interaction with life Situations under supervisory guidance, contributing to professional growth in terms of knowledge, skills and attitudes CO2: To foster attitudes in Students towards professional Self development, increasing self awareness appreciation of both capacities and limitations CO3: To develop in Students the required Skills in helping the needy by using Social work methods CO4: To enable students and enhance capacity to relate the theory to practice.
<b>Semester- VI</b>
<b>Subject and code: SUBALTERN STUDIES G 111.6a</b>
<b>Course Outcomes:</b>
CO1: To familiarize students about the basic concepts and theories related to social exclusion from social science perspective. CO2: To examine gender as a major organizing principle of contemporary social life and explore the ways that gender intersects with other important lines of social differentiation, such as caste, ethnicity, social class, sexuality, and nationality.
<b>Subject and code: G111.6b: CRIMINAL JUSTICE SYSTEM AND CORRECTIONAL SOCIAL WORK</b>
<b>Course Outcomes:</b>
CO1: To provide strong understanding about criminal justice system in India CO2: To understand functioning of criminal justice agencies CO3: To learn the role of correctional social work in criminal justice system
<b>Subject and code: SOCIAL WORK FIELD PRACTICUM</b>

**Course Outcomes:**

C01: To offer purposeful learning, experience to students through interaction with life Situations under supervisory guidance, contributing to professional growth in terms of knowledge, skills and attitudes

C02: To foster attitudes in Students towards professional Self development, increasing self awareness appreciation of both capacities and limitations

C03: To develop in Students the required Skills in helping the needy through Organizational work and use of Social work methods

C04: To train students on social work research

**Department Name:****G 100 I PSYCHOLOGY****PROGRAMME OUTCOMES**

PO 1 Develop a strong knowledge base in psychology

PO 2 Use scientific reasoning to interpret psychological phenomenon

PO 3 Design and conduct psychological research in different areas of study.

PO 4 Examine, explain, relate, recognize, accept and respect socio cultural diversity

PO 5 Transfer classroom learning to real world problems.

PO 6 Engage actively in service-learning activities to promote health, harmony, Human welfare and Well- being.

PO 7 Adopt and Display values of hope, empathy, compassion, integrity and trust

required to Build community, accept diversity, establish and maintain a sense of well-being.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO 1 : Demonstrate the ability to think critically and scientifically about human behaviour in different areas of study.

PSO 2 : Competence in understanding and developing scientific interventions to enhance human experience in various settings such as schools, industry, hospitals and community.

PSO 4 : Reflect, experience and use skills to bring about personal and social change.

PSO 5 : Understand the various manifestations of psychopathology and therapeutic techniques.

PSO 6 : Apply the basic principles of psychology to enhance human behavior at the workplace.

PSO 7 : Develop an understanding and application of the complex interplay of Bio psycho social factors impacting Health.

PSO 8 : Display competence in administering, scoring, reporting and analysis of psychometric testing.

#### **Semester- I**

#### **Subject and code: Foundations of Behaviour-I - G106 DC1.1**

#### **Course Outcomes:**

CO1 Understand the roots, history, its evolution and the goals governing the scientific study of human behaviour

CO2 Think critically and scientifically about behaviour and mental processes.

CO3 Compare and contrast major perspectives in psychology.

CO4 Describe and Evaluate basic research methods in psychological science.

CO5 Explain the biological/neurobiological underpinnings of behaviour

CO6 Demonstrate conceptual clarity and application of psychological concepts such as consciousness, sensation, perception, to everyday life.

CO 7 Exercise ethical principles and guidelines in psychological research.

CO8 Display competence in administering, scoring, reporting and analysis of psychometric tests.

#### **Subject and code: PRACTICALS: G106 DC2.1P**

<b>Course Outcomes:</b>
<p>CO1 Understand the roots, history, its evolution and the goals governing the scientific study of human behaviour</p> <p>CO2 Think critically and scientifically about behaviour and mental processes.</p> <p>CO3 Compare and contrast major perspectives in psychology.</p> <p>CO4 Describe and Evaluate basic research methods in psychological science.</p> <p>CO5 Explain the biological/neurobiological underpinnings of behaviour</p> <p>CO6 Demonstrate conceptual clarity and application of psychological concepts such as consciousness, sensation, perception, to everyday life.</p> <p>CO 7 Exercise ethical principles and guidelines in psychological research.</p> <p>CO8 Display competence in administering, scoring, reporting and analysis of psychometric tests.</p>
<b>Subject and code: Psychology of health and Wellbeing G106 OE1.1</b>
<b>Course Outcomes:</b>
<p>CO1: Understand the spectrum of health and illness for better health management</p> <p>CO2: Identify stresses in one's life and how to manage them</p> <p>CO3: Understand a variety of health announcing health protective and health compromising behaviours and to be able to know their application in illness management</p> <p>CO4: Know to identify human strengths and life enhancement</p>
<b>Semester- II</b>
<b>Subject and code: FOUNDATIONS OF BEHAVIOUR II G106 DC1.2</b>
<b>Course Outcomes:</b>
<p>CO1 Understand the roots, history, its evolution and the goals governing the scientific study of human behaviour</p> <p>CO2 Think critically and scientifically about behaviour and mental processes.</p> <p>CO3 Compare and contrast major perspectives in psychology.</p> <p>CO4 Describe and Evaluate basic research methods in psychological science.</p> <p>CO5 Explain the biological/neurobiological underpinnings of behaviour</p> <p>CO6 Demonstrate conceptual clarity and application of psychological concepts such as consciousness, learning, memory, motivation, emotion, personality and intelligence to</p>

<p>everyday life.</p> <p>CO7 Exercise ethical principles and guidelines in psychological research.</p> <p>CO8 Display competence in administering, scoring, reporting and analysis of psychometric tests.</p>
<b>Subject and code: Practicals I G106 DC2.2P</b>
<b>Course Outcomes:</b>
<p>CO1 Understand the roots, history, its evolution and the goals governing the scientific study of human behaviour</p> <p>CO2 Think critically and scientifically about behaviour and mental processes.</p> <p>CO3 Compare and contrast major perspectives in psychology.</p> <p>CO4 Describe and Evaluate basic research methods in psychological science.</p> <p>CO5 Explain the biological/neurobiological underpinnings of behaviour</p> <p>CO6 Demonstrate conceptual clarity and application of psychological concepts such as consciousness, learning, memory, motivation, emotion, personality and intelligence to everyday life.</p> <p>CO7 Exercise ethical principles and guidelines in psychological research.</p> <p>CO8 Display competence in administering, scoring, reporting and analysis of psychometric tests.</p>
<b>Subject and code: Youth, Gender and identity G106 OE1.2</b>
<b>Course Outcomes:</b>
<p>CO1: Evaluate and understand the Gender identity and Gender role</p> <p>CO2: Critically evaluate and identify determinants youth relationships</p> <p>CO3: Demonstrate an awareness of the international context of Gender Identity.</p> <p>CO4: Exhibit the consciousness of issues related to youth, gender and identity</p> <p>CO5: Understand the importance of Law and Youth</p>
<b>Semester- III</b>
<b>Subject and code: Development through life –I G106 DC1.3</b>
<b>Course Outcomes:</b>
<p>CO 1 Demonstrate the ability to think critically, analytically and to reason logically about contemporary issues in Child Development.</p>

CO 2 Examine and discuss, the major theories of child development such as those of Piaget, Sigmund Freud, Vygotsky, Bowlby and Bronfenbrenner

CO 3 Describe and use various research designs and methods to study Children.

CO 4 Understand and analyze complex Biological, Social and Cultural factors which impact the major developmental milestones from Conception through Middle childhood

CO 5 Knowledge of advancement in medical science regarding various Prenatal diagnostic techniques, reproductive techniques and interventions during prenatal and post-natal life.

CO 6 Knowledge of post birth challenges, assessments and application of theories to Infants physical, cognitive and socio emotional Development.

CO 7 Display competence in administering, scoring, reporting and analysis of psychometric tests related to children and adolescents.

**Subject and code: Practicals I G106 DC2.3P**

**Course Outcomes:**

CO 1 Demonstrate the ability to think critically, analytically and to reason logically about contemporary issues in Child Development.

CO 2 Examine and discuss, the major theories of child development such as those of Piaget, Sigmund Freud, Vygotsky, Bowlby and Bronfenbrenner

CO 3 Describe and use various research designs and methods to study Children.

CO 4 Understand and analyze complex Biological, Social and Cultural factors which impact the major developmental milestones from Conception through Middle childhood

**Subject and code: Psychology & Mental Health: Positive Human Functioning G106 OE1.3**

**Course Outcomes:**

CO 1 Understand the need to focus on flourish and wellbeing by experiencing positive emotions and humanity

CO 2 Develop and incorporate techniques to approach life and its challenges positively for good mental health

CO 3 Find meaning and purpose through meaning and value exercises to maintain a sense of well being

**Semester- IV**

<b>Subject and code: Development Through Life –II G106 DC1.4</b>
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<b>Course Outcomes:</b>
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CO 1 Demonstrate the ability to think critically, analytically and to reason logically about contemporary issues in Human development.
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CO 2 Examine, discuss and apply the theories of Human development across life span
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CO3 Apply the theories to physical, cognitive and socio emotional development from adolescence to old age and death
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CO 4 Understand and analyze complex Biological, Social and Cultural factors which Impacts physical & sensory development, Identity, relationships, work, sexuality, social roles, and end of life.
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CO 5 Application of the knowledge of human development across life and specific cohorts
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CO 5 Describe and identify, Neuro developmental disorders, problems and challenges across the life span.
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CO 6 Display competence in administering, scoring, reporting and analysis of psychometric tests related to children and adolescents.
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<b>Subject and code: Practicals I G106 DC2.4P</b>
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<b>Course Outcomes:</b>
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CO 1 Demonstrate the ability to think critically, analytically and to reason logically about contemporary issues in Human development.
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CO 2 Examine, discuss and apply the theories of Human development across life span
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CO3 Apply the theories to physical, cognitive and socio emotional development from adolescence to old age and death
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<b>Subject and code: Community Psychology G106 OE1.4</b>
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<b>Course Outcomes:</b>
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CO 1 Understand the elements of community psychology approach
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CO 2. Examine and understand the complex individual–environment interactions to bring about social change among those who have limited resources and opportunities.
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CO 3 Gain perspectives and tools to promote a fair and equitable allocation of resources and Opportunities for meaningful changes in the community
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Semester- V	
<b>Subject and code:</b>	<b>G106.5a. SOCIAL PSYCHOLOGY</b>
<b>Course Outcomes:</b>	
CO1: On completion of this course students should understand oneself, others and social behaviour.	
CO2: Understand the formation of attitudes and its effect on social behavior and methods to counter act them.	
CO3: To create awareness about the factors that influence social behaviour	
<b>Subject and code:</b>	<b>G106.5b ABNORMAL PSYCHOLOGY</b>
<b>Course Outcomes:</b>	
CO1: To introduce students to the different perspectives and models regarding the causation of mental illness	
CO2: To acquaint students with various manifestations of psychopathology.	
Semester- VI	
<b>Subject and code:</b>	<b>G106.6a Industrial AND ORGANISATIONAL PSYCHOLOGY</b>
<b>Course Outcomes:</b>	
CO1: To understand the scope and application of industrial and organizational psychology	
CO2: Provide information regarding the structure of organizations.	
CO3: To sensitize the students to problems related to human relations and human activities in organizations	
<b>Subject and code:</b>	<b>G106.6b HEALTH PSYCHOLOGY</b>
<b>Course Outcomes:</b>	
CO1: To acquaint the students with the newly emerging field of health psychology	
CO2: To understand the relationship between body and mind	
CO3: To understand the role of psychologists in managing chronic illnesses and diseases	

<b>Department Name:</b>	<b>G 100 O COMPUTER ANIMATION</b>
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<b>PROGRAMME OUTCOMES</b>
<p>PO1: Obtain a knowledge on fundamental and advanced aspects of computer animation, graphic design &amp; visual effects.</p> <p>PO2: To innovate best practices for elements of design, web technology and Gaming.</p> <p>PO3: To explore the theories of multimedia and animation to design and develop 2D/3D animations, film-making, visual effects for the Interactive media</p> <p>PO4: Apply in depth knowledge of animation and the knowledge of principles of animation in every project.</p> <p>PO5: Able to work with professional skills in animation studios and production houses.</p>
<b>PROGRAMME SPECIFIC OUTCOMES</b>
<p>PSO 1 : Understand the techniques of 2D and 3D software.</p> <p>PSO2 : Understanding stop motion and basic traditional animation</p> <p>PSO3: Understand the concept of linear and nonlinear editing, Video Capture and VFX techniques</p> <p>PSO4: Understand the web designing method with interactive animation</p>
<b>Semester- I</b>
<p><b>Subject and code: Graphic Design for Animation</b></p> <p><b>G 110 DC1.1/ G 512 DC1.1</b></p>
<b>Course Outcomes:</b>
<p>CO1: Understand the basic principles of graphic design using Corel Draw &amp; Photoshop including typography, compositing, color, and composition</p> <p>CO2: Design layouts for web pages, paper adverts, brochures, CD covers, package designing event and exhibition stall designs, pop ups, touch ups, color corrections paintings, drawings, converting B/W photo to color</p> <p>CO3: Understand the vector and bitmap graphics and its properties</p> <p>CO4: Understand different tools and features of vector and bitmap software's.</p> <p>CO5: Select and create appropriate art to convey specific artistic expression that effectively communicates the artist intent.</p> <p>CO6: To able to create different kinds of designs like Logo, Brochures, certificates, greetings cards, pamphlets, business cards etc.</p> <p>CO7: Creating GIF Animation files</p>

CO8 Display competence in administering, scoring, reporting and analysis of psychometric tests.
<b>Subject and code: Graphic Design Lab</b> <b>G 110 DC1.1P/G 512 DC1.1P</b>
<b>Course Outcomes:</b>
<p>CO1: Understand the basic principles of graphic design using Corel Draw &amp; Photoshop including typography, compositing, color, and composition</p> <p>CO2: Design layouts for web pages, paper adverts, brochures, CD covers, package designing event and exhibition stall designs, pop ups, touch ups, color corrections paintings, drawings, converting B/W photo to color</p> <p>CO3: Understand the vector and bitmap graphics and its properties</p> <p>CO4: Understand different tools and features of vector and bitmap software's.</p> <p>CO5: Select and create appropriate art to convey specific artistic expression that effectively communicates the artist intent.</p> <p>CO6: To able to create different kinds of designs like Logo, Brochures, certificates, greetings cards, pamphlets, business cards etc.</p> <p>CO7: Creating GIF Animation files CO8 Display competence in administering, scoring, reporting and analysis of psychometric tests.</p>
<b>Subject and code: Environment &amp; Character Sketching</b> <b>G 110 OE 1.1</b>
<b>Course Outcomes:</b>
<p>CO1: Do shading, colouring and gesture drawings.</p> <p>CO2: Create different perspective sketching</p> <p>CO3: Understand principles of art in detail.</p> <p>CO4: Understand different pictorial drawings and dimensions.</p> <p>CO5: Draw and understand geometrical structures.</p>
<b>Semester- II</b>
<b>Subject and code: Pre-Production and 2D Animation G 110 DC1.2/G 512 DC1.2</b>
<b>Course Outcomes:</b>
<p>CO1: Learn animation fundamentals and understand how animation works.</p> <p>CO2: Knowledge about using animation principles in 2D applications and understand the fundamental skills of 2D space</p>

<p>CO3: Work on timeline and understand tools and features to create 2D drawings</p> <p>CO4: Work systematically on layers and masking for creating motion animation</p> <p>CO5: Rendering and exporting 2D animation files in different file formats.</p> <p>CO6: Create animation sequences that employ basic cinematography principles and storytelling skills to create, develop and execute animation sequences</p> <p>CO7: Develop, assemble and present a demo reel or portfolio in a manner that meets current industry expectations, and highlights one's creativity, skills and proficiency with relevant animation software and related technologies.</p>
<p><b>Subject and code: 2D Animation Lab</b></p> <p><b>G 110 DC1.2P/G 512 DC1.2P</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO1: Learn animation fundamentals and understand how animation works.</p> <p>CO2: Knowledge about using animation principles in 2D applications and understand the fundamental skills of 2D space</p> <p>CO3: Work on timeline and understand tools and features to create 2D drawings</p> <p>CO4: Work systematically on layers and masking for creating motion animation</p> <p>CO5: Rendering and exporting 2D animation files in different file formats.</p> <p>CO6: Create animation sequences that employ basic cinematography principles and storytelling skills to create, develop and execute animation sequences</p> <p>CO7: Develop, assemble and present a demo reel or portfolio in a manner that meets current industry expectations, and highlights one's creativity, skills and proficiency with relevant animation software and related technologies.</p>
<p><b>Subject and code: Digital Designing G 110 OE 1.2</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO1: Understand digital design for print and web: resolutions, files formats, tools &amp; menus, layouts.</p> <p>CO2: Design layouts for web pages, paper advertisements, brochures, CD covers, package designing event and exhibition stall designs, pop ups, color corrections paintings, drawings, converting B/W photo to color</p> <p>CO3: A student will get a complete overview of the whole print from design to the layout to print it</p> <p>CO4: Use basic Photoshop skills and concepts to develop effective graphics for both web and print media.</p>

CO5: Discover how to edit their own photographs to get rid of dust and scratches, fix the color, and correct image exposure understand how best to choose fonts and colors for digital designs
CO6: Understand key industry-standard techniques, that are used in the print and design industries
<b>Semester- III</b>
<b>Subject and code: Visual Effects G 110 DC1.3</b>
<b>Course Outcomes:</b>
CO1: Understand the concept of linear and nonlinear editing. CO2: Understand the concept of transitions, layering. CO3: Mastering filmmaking terminology to communicate effectively throughout all stages of production. CO4: Creating quality media productions including skills in story development, producing, cinematography, editing, and audio production/post production. CO5: Edit and compress video for use in various delivery modes of digital media using standard digital video editing software. CO6: Identify hardware and software protocols specific to the field of visual effects. CO7: Create photo-real images to match live action footage by the application of advanced rendering techniques. CO8: Integrate 2D and/or 3D computer generated imagery and live action elements using compositing techniques.
<b>Subject and code: Visual Effects Lab G 110 DC2.3P</b>
<b>Course Outcomes:</b>
CO1: Understand the concept of linear and nonlinear editing. CO2: Understand the concept of transitions, layering. CO3: Mastering filmmaking terminology to communicate effectively throughout all stages of production. CO4: Creating quality media productions including skills in story development, producing, cinematography, editing, and audio production/post production. CO5: Edit and compress video for use in various delivery modes of digital media using standard digital video editing software.

CO6: Identify hardware and software protocols specific to the field of visual effects.
CO7: Create photo-real images to match live action footage by the application of advanced rendering techniques.
CO8: Integrate 2D and/or 3D computer generated imagery and live action elements using compositing techniques.
<b>Subject and code: History of animation G 110 OE 1.3</b>
<b>Course Outcomes:</b>
CO1: Understanding how the techniques in the past made things the way they are today
CO2: Understanding the thoughts, ideas, and concepts of various fields artists in the past
CO3: Gives an In-Depth Look at the World Art
CO4: Understanding & orient ourselves in the present animation techniques
CO5: Understand how to Integrate Information from the past
<b>Semester- IV</b>
<b>Subject and code: 3D Modelling G 110 DC1.4</b>
<b>Course Outcomes:</b>
CO1: Knowledge about using 3D applications and understand the fundamental skills of 3D space
CO2: Creating different types of polygon models
CO3: Creating 3D objects using line & NURBS
CO4: Creating interior designs & exterior designs
CO5: Rendering and exporting 3D files in different image file formats.
CO6: Create different 3D environments, models, structures, architectures.
CO7: Understanding how mesh works in 3D modelling.
<b>Subject and code: 3D Modelling Lab G 110 DC2.4P</b>
<b>Course Outcomes:</b>
CO1: Knowledge about using 3D applications and understand the fundamental skills of

3D space CO2: Creating different types of polygon models CO3: Creating 3D objects using line & NURBS CO4: Creating interior designs & exterior designs CO5: Rendering and exporting 3D files in different image file formats. CO6: Create different 3D environments, models, structures, architectures. CO7: Understanding how mesh works in 3D modelling.
<b>Subject and code:    Video editing G 110 OE 1.4</b>
<b>Course Outcomes:</b>
CO1: Identify and describe key terms, concepts, major trends and periods related to various modes of production. CO2: Learn how to combine basic design principles in video editing. CO3: Demonstrate skills required to create quality media productions CO4: Apply methodological design process for construction of a television program. CO5: Create an audio visual television program
<b>Semester- V</b>
<b>Subject and code:    Paper 5: 3D TEXTURING, CAMERA &amp; LIGHTING</b>
<b>Course Outcomes:</b>
CO- 1 Give detailed texturing and colouring to 3D characters or objects. CO- 2 Understand how shaders are applied. CO- 3 Understand different mapping done to enhance the details of the object. CO- 4 Understand the concept of hair dynamics and different presets. CO- 5 Creating camera animations. CO- 6 Creating a desired lighting required for the 3D scene e.g. interiors, exteriors.
<b>Subject and code : Optional 1: PAPER 6: WEB TECHNOLOGY</b>
<b>Course Outcomes:</b>
CO- 1 Understand the principles of creating an effective web page, including an in-depth consideration of information architecture.

CO- 2 Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.
CO- 3 Learn the language of the web: HTML and CSS.
CO- 4 Be able to embed social media content into web pages.
CO- 5 To create web elements and UI designs.
<b>Subject and code: Optional 2: PAPER 6: C-Programming &amp; Sound Mixing</b>
<b>Course Outcomes:</b>
CO-1. Interpret the basic principles of C Programming.
CO-2. Acquire decision making and looping concepts.
CO-3. Design and develop modular programming
CO-4. Explore usage of Arrays, strings, structures and files.
CO-5. Effective utilization of pointers and preprocessor directives.
CO-6. Illustrate the concepts of various data structures.
<b>Subject and code: Paper 5P: 3D Texturing, Camera and Lighting Lab</b>
<b>Course Outcomes:</b>
CO- 1 Creating Textures for Interior & Exterior objects
CO- 2 To create the Lights inside & outside the house
CO- 3 To move the Camera in the 4D space
<b>Subject and code: Optional 1: PAPER 6: WEB TECHNOLOGY LAB</b>
<b>Course Outcomes:</b>
CO- 1 Creating Textures for Interior & Exterior objects
CO- 2 To create the Lights inside & outside the house
CO- 3 To move the Camera in the 4D space
<b>Semester- VI</b>
<b>Subject and code : Paper 7: 3D Rigging &amp; Animation</b>
<b>Course Outcomes:</b>
CO- 1 Understand and create Object and character animation.
CO- 2 Understand different controllers, wraps and modifiers.

CO- 3 Work with poses and postures.
CO- 4 Work with bone parameters and IK Solvers.
CO- 5 Do skinning process with much ease.
<b>Subject and code: Optional 3: Paper 8: Media &amp; Interactive Animation</b>
<b>Course Outcomes:</b>
CO-1. Utilize several Flash tools and tactics learned throughout the course to produce an interactive flash based website.
CO-2. Demonstrate the ability to effectively utilize the timeline and motion tween affects to produce animation.
CO-3. Demonstrate critical thinking in problem solving.
CO-4. Designing industry standard e learning animations.
CO-5. Applying interactivity to the animations with the help of Action script.
CO-6. Develop and demonstrate troubleshooting skill.
<b>Subject and code: Optional 4: Paper 8: VISUAL PROGRAMMING</b>
<b>Course Outcomes:</b>
CO-1. Create Different types of Vector Art, Background design, Logos, Greeting Card etc
CO-2. Creating GIF animation clips for the websites
<b>Subject and code: Paper 7 P: 3D Animation Lab</b>
<b>Course Outcomes:</b>
CO- 1 Moving the skelton & Bones of 3D objects.
CO- 2 Understand and create Object and character animation.
CO- 3 Attaching skin to the bones
<b>Subject and code: Optional 3: Paper 8: Interactive animation lab</b>
<b>Course Outcomes:</b>
CO-1. Understand the Action script fundamentals.
CO-2. Design and develop animations using Action script for web and internet applications.
CO-3. Publishing the animations on different devices and applications.

<b>Department Name:</b>	<b>G 300 A</b> <b>B. Com (Regular)</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO 1: Develop a thorough understanding of various fundamental concepts of commerce, finance and economics and apply them in real life situations.</p> <p>PO 2: Apply knowledge, understanding and skill to identify the unsolved problems in rapidly changing business environment and analyse and assess these problems using appropriate methodology.</p> <p>PO 3: Develop a good value system leading to high ethical and moral conduct, to meet the expectations of established legal practices in the field of Commerce.</p> <p>PO 4: Stand with the requirement of business sector seeking youth fit for employment in the world of work, with the acquired competencies and attitudes.</p> <p>PO 5: Build a strong footing for advanced studies in Commerce and its allied areas on multiple disciplines concerned with commerce.</p> <p>PO 6: Engage in the process of reflective, independent and pragmatic thinking by understanding the concepts in every area of commerce and business.</p> <p>PO 7: Acquire various soft skills like communication, analytical and computer literacy required to manage complete business situation as well as life situations.</p> <p>PO 8: Apply their knowledge necessary to address complex environmental, gender related and legal issues at local, regional and global scale.</p> <p>PO 9: Write analytically in a variety of formats, including essays, research papers, reflective writing, and critical reviews of secondary sources using language skills.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO-1: Understand various concepts and theories providing strong academic foundation in the field of economics and business.</p> <p>PSO-2: Acquaint and demonstrate practical skills in areas of Marketing, Banking, Business Management, Taxation and Human Resource Management.</p> <p>PSO-3: Acquire practical skills to work as tax consultant, audit consultant, investment consultant and other financial supporting services.</p>	

<p>PSO-4: Apply the practical skills in Accounting and Costing and able to handle independently accounts and costing functions in the business.</p> <p>PSO-5: Exhibit gender sensitivity with the knowledge gained from the aspects related to gender equity.</p> <p>PSO-6: Apply various technical ICT tools to explore, analyse and use the information for business purposes.</p>
<b>Semester- I</b>
<p><b>Subject and code: Financial Accounting</b></p> <p><b>G 310DC1.1</b></p>
<b>Course Outcomes:</b>
<p>CO1: Understand the theoretical framework of accounting as well accounting standards.</p> <p>CO2: Demonstrate the preparation of financial statement of manufacturing and non-manufacturing entities of sole proprietors.</p> <p>CO3: Exercise the accounting treatments for consignment transactions &amp; events in the books of consignor and consignee</p> <p>CO4: Understand the accounting treatment for royalty transactions &amp; articulate the Royalty agreements.</p> <p>CO5: Outline the emerging trends in the field of accounting</p>
<p><b>Subject and code: Management Principles and Applications</b></p> <p><b>G310DC2.1</b></p>
<b>Course Outcomes:</b>
<p>CO1: Understand and identify the different theories of organizations, which are relevant in the present context.</p> <p>CO2: Design and demonstrate the strategic plan for the attainment of organizational goals.</p> <p>CO3: Differentiate the different types of authority and chose the best one in the present context.</p> <p>CO4: Compare and chose the different types of motivation factors and leadership styles.</p>
<p><b>Subject and code: Principles of Marketing</b></p> <p><b>G310DC3.1 (Open Elective Course)</b></p>

<b>Course Outcomes:</b>
<p>CO1: Understand the basic concepts of marketing and assess the marketing environment.</p> <p>CO2: Analyze the consumer behaviour in the present scenario and marketing segmentation.</p> <p>CO3: Discover the new product development &amp; identify the factors affecting the price of a product in the present context.</p> <p>CO4: Judge the impact of promotional techniques on the customers &amp; importance of channels of distribution.</p> <p>CO5: Outline the recent developments in the field of marketing.CO2: Create different perspective sketching</p>
<b>Subject and code: Managerial Economics</b> <b>G310OE1.1</b>
<b>Course Outcomes:</b>
<p>CO1: Describe the importance of managerial economics in decision making process.</p> <p>CO2. Learners would be able to apply the concepts and principles in their day to daylife.</p> <p>CO3. Analyze how economic agents make decisions and choices using theoretical knowledge &amp; practical approach.</p>
<b>Subject and code: Accounting for Everyone</b> <b>G310OE2.1 (Open Elective Course)</b>
<b>Course Outcomes:</b>
<p>CO1: Analyze various terms used in accounting;</p> <p>CO2. Make accounting entries and prepare cash book and other accounts necessary while running a business;</p> <p>CO3. Prepare accounting equation of various business transactions</p> <p>CO4: Analyze information from company's annual report;</p> <p>CO5: Comprehend the management reports of the company.</p>
<b>Subject and code: Financial Literacy</b> <b>G310 OE3.1 (Open Elective Course)</b>

<b>Course Outcomes:</b>
CO1. Describe the importance of financial literacy and list out the institutions providing financial services; CO2. Prepare financial plan and budget and manage personal finances; CO3. Open, avail, and manage/operate services offered by banks; CO4. Open, avail, and manage/operate services offered by post offices; CO5. Plan for life insurance and property insurance & select instrument for investment in shares
<b>Semester- II</b>
<b>Subject and code: Advanced Financial Accounting</b> <b>G310DC1.2</b>
<b>Course Outcomes:</b>
CO1: Understand & compute the amount of claims for loss of stock & loss of Profit. CO2: Learn various methods of accounting for hire purchase transactions. CO3: Deal with the inter-departmental transfers and their accounting treatment. CO4: Demonstrate various accounting treatments for dependent & independent branches. CO5: Prepare financial statements from incomplete records.
<b>Subject and code: Business Mathematics</b> <b>G310DC2.2</b>
<b>Course Outcomes:</b>
CO1: Understand the number system and indices applications in solving basic business problems. CO2: Apply concept of commercial arithmetic concepts to solve business problems. CO3: Make use of theory of equation in solving the business problems in the present context. CO4: Understand and apply the concepts of Set Theory, Permutations & Combinations and Matrices solving business problems. CO5: Apply measurement of solids in solving simple business problems.

**Subject and code : Corporate Administration****G310DC3.2****Course Outcomes:**

- CO1: Understand the framework of Companies Act of 2013 and different kind of companies.
- CO2: Identify the stages and documents involved in the formation of companies in India.
- CO3: Analyze the role, responsibilities and functions of Key management Personnel in Corporate Administration.
- CO4: Examine the procedure involved in the corporate meeting and the role of company secretary in the meeting.
- CO5: Evaluate the role of liquidator in the process of winding up of the company.

**Subject and code : Law and Practice of Banking****G 310DC4.2****Course Outcomes:**

- CO1: Summarize the relationship between Banker & customer and different types of functions of banker.
- CO2: Analyse the role, functions and duties of paying and collecting banker.
- CO3: Make use of the procedure involved in opening and operating different accounts.
- CO4: Examine the different types of negotiable instrument & their relevance in the present context.
- CO5: Estimate possible developments in the banking sector in the upcoming days.

**Subject and code : PUBLIC FINANCE****G 310 OE1.2 (Open Elective Course)****Course Outcomes:**

- CO1: Identify the basis of Money and sources of Public Finance
- CO2: Identify the stages of business cycles and take appropriate decisions.

**Subject and code : Financial Environment****G 310 OE2.2 (Open Elective Course)****Course Outcomes:**

- CO1. Understand the fundamentals of Indian Economy and its significance.
- CO2. Evaluate the impact of monetary policy on the stakeholders of the Economy.
- CO3. Assess the impact of fiscal policy on the stakeholders of the Economy.
- CO4. Examine the status of inflation, unemployment and labour market in India

CO5. Inference the financial sector reforms in India.
<b>Subject and code : Investing in Stock Markets</b> <b>G 310 OE3.2 (Open Elective Course)</b>
<b>Course Outcomes:</b>
CO1: Explain the basics of investing in the stock market, the investment environment as well as risk & return. CO2. Analyze Indian securities market; CO3. Examine EIC framework and conduct fundamental analysis; CO4. Perform technical analysis; CO5. Invest in mutual funds market.
<b>Semester- III</b>
<b>Subject and code: Corporate Accounting</b> <b>G310DC1.3</b>
<b>Course Outcomes:</b>
CO 1: Maintain the books of accounts and pass accounting entries of corporate entities. CO 2: Prepare the annual accounts of companies as per the Companies Act 2013 CO 3: Independently value the goodwill and shares for the benefit of stakeholders of the corporate entities. CO 4: Get an awareness of current issues of social accounting, environmental accounting, buy back of shares and Human Resource Accounting
<b>Subject and code: Business Statistics</b> <b>G310DC2.3</b>
<b>Course Outcomes:</b>
CO1: Identify a statistical method for solving practical problems. CO2: Discuss critically the uses and limitation of statistical techniques. CO3: Describe and discuss the key terminology, concepts, tools and techniques used in business statistical analysis. CO4: Evaluate critically the underlying assumptions of analysis tools.
<b>Subject and code: Cost Accounting</b>

<b>G310DC3.3</b>
<b>Course Outcomes:</b>
CO 1: Apply the knowledge of basic concepts of cost accounting. CO 2: Execute the preparation of cost sheet. CO 3: Understand the concept of material control CO 4: Analyse overhead cost classifications and methods of absorption of overheads CO 5: Identify the causes of disagreements in profits and reconcile the same.
<b>Subject and code: Entrepreneurial skills</b> <b>G310OE1.3 (Open Elective Course)</b>
<b>Course Outcomes:</b>
CO1: Learn skills to be an effective and capable entrepreneur. CO2: Comprehend the key factors influencing entrepreneurial possibilities. CO3: Recognize and creatively think to design and innovate unique business opportunities. CO4: Understand the skills and knowledge for running and managing a new business.
<b>Subject and code: Advertising Skills</b> <b>G310OE2.3(Open Elective Course)</b>
<b>Course Outcomes:</b>
CO1: Explain types of advertising media. CO2: Identify the factors that affect media selection. CO3: To learn evolve advertising strategy, formulate budget CO4: Understand ethical aspects in advertising CO5: Familiarize online portals in advertising
<b>Subject and code: Modern Bank Management</b> <b>G310OE3.3 (Open Elective Course)</b>
<b>Course Outcomes:</b>
CO 1: Have clear understanding of the concepts and operations of modern banks CO 2: Get knowledge in functions of RBI and other banks. CO 3: Understand various modern banking products and services offered.

Semester- IV
<b>Subject and code: Advanced Corporate Accounting</b> <b>G310DC1.4</b>
<b>Course Outcomes:</b>
CO1: Differentiate between Amalgamation and Restructuring and their accounting procedures CO2: To prepare consolidated financial statements of Holding and Subsidiary Companies CO3: Understand the implications IFRS and their significance in the corporate accounting CO4: Understand the concept of value added and value added statement in corporate accounting. CO5: Account for corporate brands
<b>Subject and code: Costing Methods &amp; Techniques</b> <b>G310DC2.4</b>
<b>Course Outcomes:</b>
CO1: Understand the concept of Job, Batch and Contract costing. CO2: Apply the knowledge gained in the preparation of a budget and use budgets for performance evaluation after flexing the budget. CO3: Interpret variable cost variances and fixed cost variances. CO4: Explain the concept of cost audit and cost accounting records.
<b>Subject and code: Business Regulatory Framework</b> <b>G310DC3.4</b>
<b>Course Outcomes:</b>
CO1: Understand the concept of Business Regulatory Framework CO2: Able to apply the Rules and Regulations associated with business CO3: Ability to understand the legal provisions to enter into contract CO4: Recognize and identify the extent to which law is important in business dealings.
<b>Subject and code: Financial Education and Investment Awareness</b> <b>G 702 AE1.4 - Skill Enhancement Course</b>
<b>Course Outcomes:</b>
CO1: Understand the concept of Business Regulatory Framework

CO2:Able to apply the Rules and Regulations associated with business
CO3:Ability to understand the legal provisions to enter into contract
CO4: Recognize and identify the extent to which law is important in business dealings.
<b>Semester- V</b>
<b>Subject and code: CORPORATE ACCOUNTING - I</b>
<b>Course Outcomes:</b>
CO-1: Explain meaning, features and types of companies, issue, reissue and forfeiture of shares
CO-2: Outline SEBI guidelines on underwriting of shares, types of underwriting
CO-3: Discuss the meaning and features of goodwill
CO-4: List out various methods of valuation of goodwill and valuation of shares
CO-5: Prepare the final accounts of companies
CO-6: Explain meaning, features and types of debentures and illustrates methods of redemption of debentures
CO-7: Investigate recent issues in financial accounting
<b>Subject and code: INTERNATIONAL BUSINESS</b>
<b>Course Outcomes:</b>
CO-1: Acquaint the knowledge related to international trade.
CO-2: Outline the balance of payment of nation and analyse the economic condition.
CO-3: Examine the working condition of various international institutions.
CO-4: Describe the trade policies and trade barriers involved in international business
CO-5: Analyse the reforms related to foreign capital in India
CO-6: Explain different forms of economic integration
<b>Subject and code: PRINCIPLES AND PRACTICE OF AUDITING</b>
<b>Course Outcomes:</b>
CO-1: Develop the knowledge of fundamental audit concepts.
CO-2: Explain different types of audit report, written representations and the final review and report.
CO-3: Determine the appropriate company audit report for a given audit situation
CO-4: Perform verification of vouchers

CO-5: Understand the procedures of company audit and auditors report
<b>Subject and code: BUSINESS LAW</b>
<b>Course Outcomes:</b>
CO-1: Understand the concept of law through various acts. CO-2: Describe the essentials of offer and acceptance CO-3: Assess the legality of agreement CO-4: Examine the effects of consent and misrepresentation CO-5: Develop an understanding of discharge of contract CO-6: Outline the legal aspects of right to information and cyber law
<b>Subject and code: FINANCIAL MANAGEMENT</b>
<b>Course Outcomes:</b>
CO 1: Understand the role and purpose of the financial management function CO 2: Acquire the knowledge of patterns of capital structure and capital structure planning CO 3: Clear understanding of Theories of Capital Structure CO 4: Understand Dividend Policies and Theories on Dividend Policies. CO 5: Get practical knowledge in Capital Budgeting and techniques of Capital Budgeting CO 6: Understand the working of lease financing
<b>Subject and code: Business Taxation</b>
<b>Course Outcomes:</b>
CO-1: Apply the knowledge of assessment of HUF CO-2: Describe the meaning of firms and AOP/BOI and assessment of its total income and tax liability CO-3: Develop an understanding of different forms of companies and computation of tax liability of companies CO-4: Explain the assessment procedures of different assessees CO-5: Understand the benefits of tax planning
<b>Semester- VI</b>
<b>Subject and code: CORPORATE ACCOUNTING - II</b>
<b>Course Outcomes:</b>
CO-1: Understand the concept of merger, absorption and external reconstruction. CO-2: Execute the accounting treatments for amalgamation and external reconstruction. CO-3: Analyse the accounting process of internal reconstruction and liquidation of companies. CO-4: Apply the accounting knowledge of holding companies accounts. CO-5: Explain the concept and application of value added. CO-6: Examine the recent issues in Financial Accounting
<b>Subject and code: FOREIGN EXCHANGE MANAGEMENT</b>

<b>Course Outcomes:</b>
CO-1: Understand the evolution of foreign exchange market CO-2: Describe the various players in the foreign exchange management CO-3: Develop an understanding of arithmetic and interbank deals CO-4: Explain the regulations of foreign exchange market CO-5: Outline the different dimensions of foreign exchange in Indian context
<b>Subject and code:    GST and Customs Law</b>
<b>Course Outcomes:</b>
CO – 1: Understand the basic concepts of GST CO – 2: Explain the concept of supply under GST CO – 3: Describe the procedures involved in the registration of a taxable person under GST CO – 4: Acquire the knowledge of computation of value of taxable supply under GST and    customs duty CO - 5: Determine the amount of GST liability and customs duty.
<b>Subject and code:    Corporate Law and Governance</b>
<b>Course Outcomes:</b>
CO-1: Understand the procedural requirements for the formation of a company CO-2: Identify and modes of acquiring membership of accompany CO-3: Outline the requisites of a valid meeting CO-4: Describe the procedures involved in winding up of companies CO-5: Assess the mechanisms available to improve corporate governance CO-6: Evaluate the corporate social responsibility projects of business organisations
<b>Subject and code:    MANAGEMENT ACCOUNTING</b>
<b>Course Outcomes:</b>
CO-1: Understand management accounting and its objectives in facilitating decision making. CO-2: Apply accounting ratios and make financial analysis and prepare reports. CO-3: Acquaint with the knowledge of preparing Cash Flow and Funds Flow statements CO-4: Analyze cost-volume-profit techniques to determine optimal managerial decisions. CO-5: Perform cost variance analysis and demonstrate the use of standard costs in flexible budgeting. CO-6: Understand the aspects, importance and applicability of Responsibility Accounting,

Management Audit
CO-7: Apply the techniques of financial forecasting
<b>Subject and code: SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT</b>
<b>Course Outcomes:</b>
CO-1: Acquire theoretical and practical background in the field of investments.
CO-2: Develop an insight into the relationship of the risk and return.
CO-3: Understand theories of Portfolio management and also the tools and techniques for efficient portfolio management.
CO-4: Apply the concept of portfolio management for the better investment.
CO-5: Analyse different types of fundamental and technical analysis
CO-6: Explain the asset pricing theories and concept of derivatives

<b>Department Name:</b>	<b>G 300 B</b> <b>B. Com (CA INTEGRATED)</b>
<b>PROGRAMME OUTCOMES</b>	
<p>P01: Students will be able to critically analyze the Indian Accounting standards and unbiased reporting to concerned authorities in the capacity of a Chartered Accountant.</p> <p>P02: Students will be able to effectively communicate within and outside the business organisations by developing effective listening, speaking or expressing fluently in different languages through electronic media and thereby connecting people and the business.</p> <p>P03: Students will be able to interact freely with members of national body like ICAI, in parallel collaboration with KVC Academy and take their guidance to further their careers as Chartered Accountants.</p> <p>P04: Students will demonstrate empathetic concerns towards marginalized societies and contribute towards responsible auditing leading to businesses which enhance</p>	

<p>economic development of the nation.</p> <p>PO5: Students will be able to deal with ethical issues while reporting and inculcate high value system by avoiding misuse of public funds, frauds and scams. They will accept responsibility by being truthful and honest in their careers as Chartered Accountants, by upholding International Accounting Standards.</p> <p>PO6: By learning national and international environmental issues, students will show sensitivity towards sustainability and maintain ecological balance in large and small business organisations by effectively auditing CSR activities.</p> <p>PO7: Students will develop the ability to learn constantly through-out their careers as Chartered Accountants and thereby contribute significantly towards changes that take place in economic and business world.</p>
<b>PROGRAMME SPECIFIC OUTCOMES</b>
<p>PSO1: Understand and analyze the Indian Accounting standards and fundamental accounting concepts and conventions along with preparation of annual accounts of proprietary and professional concerns.</p> <p>PSO2: Develop abilities and applications of specific accounting standards and legislations to various business transactions.</p> <p>PSO3: Understand environmental issues, Laws of Partnership, National Income and its measurements and thereby develop entrepreneurship qualities.</p> <p>PSO4: Analyze the provisions of company law and acquire the abilities to address its application in auditing the company's books of accounts.</p> <p>PSO5: Understand basic concepts of Cost and Management Accounting and learning to prepare Cost Sheets by integrating accounting systems.</p> <p>PSO6: Understanding the provisions of income-tax laws and acquire the ability to apply such knowledge to make computations and address application-oriented issues.</p>
<b>Semester- I</b>
<p><b>Subject and code: Financial Accounting- I</b></p> <p><b>G 340DC1.1</b></p>
<b>Course Outcomes:</b>
<p>CO1. Students will have the basic knowledge of Accounting Concepts, Principles and Conventions.</p>

CO2. Understand the evolution and importance of Accounting Standards used while maintaining and reporting financial statements.

CO3. Ability to Prepare Trial balance, rectify errors and prepare Bank Reconciliation statement.

CO4. Able to calculate Costs of inventories, understand the basis of valuing inventory and maintain necessary records.

CO5. Understand the concepts of depreciation, apply various methods of depreciation while preparing financial statements.

CO6. Ability to analyse special transactions and give accounting treatment for bills of exchange, promissory notes, sale of goods on approval and return basis.

**Subject and code: Business Law**

**G340 DC2.1**

**Course Outcomes:**

CO1. Define Indian Contract Act, 1872 and understand the legal rules of valid contract, valid consideration and rules of offer and acceptance

CO2. Understand the legality of Minors Contract, rules relating to validity of a contract with minor, concepts of coercion, undue influence, Fraud, Misrepresentation, Mistake, wagering agreements.

CO3. Ability to understand and define the Sale of Goods Act, 1930, elements of contract of sale, agreement to sell, warranties and guarantees.

CO4. Understand the concept of Ownership of goods, legal implications involved in transfer of ownership of goods, right of disposal of goods.

CO5. Ability to apply various legal laws involved in day to day dealing of business transactions and understand its importance.

**Subject and code: Business Statistics**

**G340DC3.1**

**Course Outcomes:**

CO1. Ability to grasp concepts like Correlation and Regression and its applicability in research and findings.

CO2. Develop the skill to apply statistical methods in making decisions based on probability of business events.
CO3. Ability to calculate and find out expected values of a random variable and mathematical expectation.
CO4. Understand concepts of Theoretical Distributions involving calculation of Binomial distribution and Poisson distribution.
CO5. Analyse basic application and normal distribution of statistical data.

**Subject and code: Managerial Economics**

**G340OE1.1**

**Course Outcomes:**

- CO1: Will acquaint with the basic knowledge on the concept of business economics  
CO2: Ability to understand the consumer behavior in different market situations  
CO3: Understand market structure and demand analysis

**Semester- II**

**Subject and code: Advanced Financial Accounting I**

**G340 DC1.2**

**Course Outcomes:**

- CO1. Ability to understand and analyse special accounting transactions  
CO2. Identify the method to prepare and present financial statements of various business entities.  
CO3. Analyse and calculate special transactions in accounting like, Average Due Date and prepare Account Current.  
CO4. Ability to prepare Final Accounts of Sole Proprietors, Partnerships and Not for Profit Organisations.  
CO5. Describe the accounting system of Joint Stock Companies, understand the concept of shares and debentures, forfeiture, reissue of shares and be able to prepare final accounts of Companies in the form of Statement of Profit and Loss and Balance sheet.

**Subject and code : Logical Reasoning**

**G340 DC2.2**

**Course Outcomes:**

- CO1. Symbolise Series, types of series, Coding and Decoding of letters and numbers.  
CO2. Identify Direction tests of North, South, East, West and seating arrangements

depending on Linear, Circular and Polygon structures.

CO3. Understand and evaluate Blood Relations and Syllogism.

CO4. Develop Logical thinking in categorical propositions like hypothetical and disjunctive propositions.

**Subject and code : BUSINESS & COMMERCIAL KNOWLEDGE**

**G340 DC3.2**

**Course Outcomes:**

CO1. To evaluate the broad economic environment issues relating to the business, like Micro and Macro business environment.

CO2. Understand and apply the laws of partnership and Limited Liability Partnership.

CO3. Ability to understand the various common business terminologies used in finance and marketing.

CO4. Identify the features and classification of a company as per the Companies Act of 2013.

CO5. Describe the process of incorporation of a company and draft the documents like Memorandum of Association and Articles of Association.

**Subject and code : Managerial Economics – II**

**G 340DC4.2**

**Course Outcomes:**

CO1: Acquaint with the advanced knowledge on the concept of managerialeconomics

CO2: Understand consumer behavior in different market situations

CO3: Understand market structure and demand analysis

**Semester- III**

**Subject and code: Advanced Financial Accounting II**

**G340 DC1.3**

**Course Outcomes:**

CO1: Understand of the provisions of income-tax law and apply the same while filing income tax returns.

CO2: Ability to apply income tax knowledge to make computations and address application-oriented issues.

CO3: Calculate taxable income for corporates

CO4: Compute Annual value of Self occupied and let out properties

**Subject and code: TAX LAWS AND PRACTICE**

**G340DC2.3**

**Course Outcomes:**

CO1: Identify a statistical method for solving practical problems.

CO2: Discuss critically the uses and limitation of statistical techniques.

CO3: Describe and discuss the key terminology, concepts, tools and techniques used in business statistical analysis.

CO4: Evaluate critically the underlying assumptions of analysis tools.

**Subject and code: Cost Accounting**

**G340DC3.3**

**Course Outcomes:**

CO1: Ability to develop an understanding of the basic concepts and applications to establish the cost associated with the production of products

CO2: Apply provision of services and use the same to determine prices.

CO3: Develop an understanding of cost accounting statements.

CO4: Acquire the ability to apply cost information for cost ascertainment, planning, control and decision-making.

**Subject and code : CORPORATE LAW**

**G340 OE1.3 (Open Elective Course)**

**Course Outcomes:**

CO1: Develop an understanding of the provisions of company law

CO2: Acquire the ability to address application-oriented issues.

CO3: Ability to draft prospectus of the company

CO4: Understand the Companies Act and its provisions.

**Subject and code: Advertising Skills**

**G340OE2.3 (Open Elective Course)**

**Course Outcomes:**

CO1: Explain types of advertising media.

CO2: Identify the factors that affect media selection.

CO3: To learn evolve advertising strategy, formulate budget

CO4: Understand ethical aspects in advertising

CO5: Familiarize online portals in advertising

**Subject and code: Entrepreneurial skills**

**G340OE3.3 (Open Elective Course)**

**Course Outcomes:**

CO1: Learn skills to be an effective and capable entrepreneur.

CO2: Comprehend the key factors influencing entrepreneurial possibilities.

CO3: Recognize and creatively think to design and innovate unique business opportunities.

CO4: Understand the skills and knowledge for running and managing a new business.

**Subject and code: Modern Bank Management**

**G340OE4.3 (Open Elective Course)**

**Course Outcomes:**

CO 1: Have clear understanding of the concepts and operations of modern banks

CO 2: Get knowledge in functions of RBI and other banks.

CO 3: Understand various modern banking products and services offered.

**Semester- IV**

**Subject and code: Corporate Accounting**

**G340 DC1.4**

**Course Outcomes:**

CO1: Gain basic knowledge in Accounting Standards and IFRS

CO2: Acquaint with practical knowledge in redemption of debentures

CO3: Understand the accounting aspects relating to Bonus and rights issue

CO4: Understand the concept and accounting relating to Cashflow statements

**Subject and code: Costing Methods & Techniques**

**G340DC2.4**

**Course Outcomes:**

CO1: Understand the basic concepts and processes used to determine product

CO2: Ability to interpret cost accounting statements

CO3: Analyze and evaluate information for cost ascertainment, planning, control and decision making.

**Subject and code: TAX LAWS AND PRACTICE II**

<b>G340DC3.4</b>
<b>Course Outcomes:</b>
CO1: Develop an understanding of the provisions of income-tax law CO2: Acquire the ability to apply such knowledge to make computations CO3: Ability to address application-oriented issues. CO4: Compute total income and tax liability of individuals
<b>Subject and code: Business Ethics (Open Elective Course)</b>
<b>G340OE1.4</b>
<b>Course Outcomes:</b>
CO1:Understand the basics of ethics CO2:Make a distinction between morality and ethics CO3:Analyze the case studies and make interpretations CO4:Prepare reports based on ethical code of conduct in an organization.
<b>Subject and code: Corporate Governance(Open Elective Course)</b>
<b>G340OE2.4</b>
<b>Course Outcomes:</b>
CO1:Analyze fundamental theories of ethics CO2:Make a distinction between morality and ethics CO3:Analyze the case studies and make interpretations CO4:Prepare reports based on ethical code of conduct in an organization.
<b>Subject and code: International Trade (Open Elective Course)</b>
<b>G340OE3.4</b>
<b>Course Outcomes:</b>
CO1:Analysis of trade models in depth in order to discuss the benefits and consequences of international trade and globalization. CO2:The course will slightly delve into international finance in order to discuss different exchange rate regimes, their effect on monetary/fiscal policy, and economic integration. CO3:Understand the legal procedures involved in International Business. CO4:Recognize the different types of economic integrations. CO5:Understand and analyze the operations of MNCs through real case assessment.

CO6: Evaluate India's foreign trade status
<b>Semester- V</b>
<b>Subject and code: ADVANCED ACCOUNTING – I</b> <b>G 361.5</b>
<b>Course Outcomes:</b>
CO1: To acquire the ability to apply specific Accounting Standards, Guidance Notes and legislations to different transactions and events and in preparation and presentation of financial statements of business entities; CO2: To understand and apply financial reporting and regulatory requirements of Banking, Financial services
<b>Subject and code: ECONOMICS FOR FINANCE</b> <b>G 362.5</b>
<b>Course Outcomes:</b>
CO1: To develop an understanding of various aspects of Finance and acquire the ability to apply such knowledge in decision-making.
<b>Subject and code: AUDITING AND ASSURANCE – I</b> <b>G 363.5</b>
<b>Course Outcomes:</b>
CO1: To develop an understanding of the concepts in auditing and of the generally accepted auditing procedures, techniques and skills and acquire the ability to apply the same in audit and attestation engagements
<b>Subject and code: STRATEGIC MANAGEMENT</b> <b>G 364.5</b>
<b>Course Outcomes:</b>
CO1: To develop an understanding of strategic management concepts and techniques and acquire the ability to apply the same in business situations
<b>Subject and code: FINANCIAL MANAGEMENT – I</b> <b>G 365.5</b>
<b>Course Outcomes:</b>
CO1: To develop an understanding of various aspects of Financial Management and acquire the ability to apply such knowledge in decision-making.
<b>Subject and code: ACCOUNTING STANDARDS</b> <b>G 366.5</b>
<b>Course Outcomes:</b>
CO1: To acquire the ability to apply specific Accounting Standards, Guidance Notes and legislations to different transactions and events and in preparation and

presentation of financial statements of business entities; CO2: To understand and apply financial reporting and regulatory requirements of Banking, Financial services and Insurance sector
<b>Semester- VI</b>
<b>Subject and code:   ADVANCED ACCOUNTING – II</b> <b>G 361.6</b>
<b>Course Outcomes:</b>
CO1: To acquire the ability to apply specific Accounting Standards, Guidance Notes and legislations to different transactions and events and in preparation and presentation of financial statements of business entities; CO2: To understand and apply financial reporting and regulatory requirements of Banking, Financial services and Insurance sector
<b>Subject and code:   INTERNATIONAL TAXATION</b> <b>G 362.6</b>
<b>Course Outcomes:</b>
CO1: To develop an understanding of the concepts, principles and provisions relevant to international taxation and acquire the ability to apply such knowledge to make computations and address issues in practical case scenarios.
<b>Subject and code:   STRATEGIC FINANCIAL MANAGEMENT</b> <b>G 363.6</b>
<b>Course Outcomes:</b>
CO1: To acquire the ability to apply financial management theories and techniques in strategic decision making
<b>Subject and code:   FINANCIAL MANAGEMENT – II</b> <b>G 364.6</b>
<b>Course Outcomes:</b>
CO1: To develop an understanding of various aspects of Financial Management and acquire the ability to apply such knowledge in decision-making
<b>Subject and code:   AUDITING AND ASSURANCE - II</b> <b>G 365.6</b>
<b>Course Outcomes:</b>
CO1: To develop an understanding of the concepts in auditing and of the generally accepted auditing procedures, techniques and skills and acquire the ability to apply the same in audit and attestation engagements.
<b>Subject and code: ENTERPRISE INFORMATION SYSTEMS</b> <b>G 366.6</b>

**Course Outcomes:**

C01: To develop an understanding of technology enabled Information Systems and their impact on enterprise-wide processes, risks and controls.

**Department Name:****G 300 C B. Com****(ACCA EMBEDDED)****PROGRAMME OUTCOMES**

PO 1: Students will be able to critically analyze the Global Accounting standards and reporting while making a decision as finance and administrative Executives in the capacity of an ACA Affiliate.

PO2: Students will be able to effectively communicate within and outside the multi-cultural organisations at a global level by frequent interactions leading to effective listening and interpreting matters concerned thus develop negotiating skills.

PO3: Students will be able to interact freely with members of global body like ISDC, with which the college has MOU and take their guidance to enrich their global careers.

PO4: Students will demonstrate empathetic concerns towards global citizens and contribute towards the development of the various nations, by being well informed regarding Corporate Social Responsibility issues and actively participating in resolving international crisis affecting the corporate world.

PO5: Students will be able to deal with ethical dilemmas and value systems existing in the global corporate organisations and accept responsibilities by enforcing ethical code of conducts.

PO6: By learning global environmental issues, students will show sensitivity towards sustainability and ecology in corporate organisations at an international level.

PO7: Students will develop the ability to learn constantly through-out their global careers and thereby contribute significantly towards social and technological changes.

PO6: Learning environmental issues, students will show sensitivity towards

sustainability and ecology in corporate organisations.

PO7: Students will have the ability to keep updating technical knowledge and will be exposed to corporates through apprenticeship for a period of six months.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO1: Understand internationally accepted financial accounting and reporting practices throughout the program.

PSO2: Analyze and apply various fundamental knowledge of accounting, Taxation laws, Financial reporting techniques in corporates and other institutions.

PSO3: In depth knowledge of business concepts like Risk Management, Corporate Governance, Business Ethics which is required to manage the organisations effectively.

PSO4: Understand the applications of Management accounting, Auditing techniques, Cost Accounting techniques and Finance in business organisations.

#### **Semester- I**

**Subject and code: INTERNATIONAL FINANCIAL ACCOUNTING  
G 320 DC1.1**

#### **Course Outcomes:**

CO1: Explain the context and purpose of financial Reporting

CO2: Define the qualitative characteristics of financial information

CO3: Demonstrate the use of double-entry and accounting systems

CO4: Record transactions and events

CO5: Prepare a trial balance (including identifying and correcting errors)

CO6: Prepare basic financial statements for incorporated and unincorporated entities.

CO7: Prepare simple consolidated financial Statements

CO8: Interpretation of financial statements

**Subject and code: Organisational Behaviour  
G 320 DC 2.1**

#### **Course Outcomes:**

CO1: To understand the basic concept of organizational behavior

CO2: To know the importance of change in the organization

CO3: To know different types of leadership in the organization and leadership theories

CO4: To provide knowledge in group behavior and the methods of handling informal groups
CO5: To acquaint with the knowledge of motivation theories and importance of motivation management
<b>Subject and code: Principles of Marketing</b> <b>G 320 DC3.1</b>
<b>Course Outcomes:</b>
CO1: Understand the basic concepts of marketing and assess the marketing environment.
CO2: Analyze the consumer behaviour in the present scenario and marketing segmentation.
CO3: Discover the new product development & identify the factors affecting the price of a product in the present context.
CO4: Judge the impact of promotional techniques on the customers & importance of channels of distribution.
CO5: Outline the recent developments in the field of marketing.
<b>Subject and code: Managerial Economics</b> <b>G 320 OE1.1</b>
<b>Course Outcomes:</b>
CO1: Describe the importance of managerial economics in decision making process.
CO2. Learners would be able to apply the concepts and principles in their day to day life.
CO3. Analyze how economic agents make decisions and choices using theoretical knowledge & practical approach.
<b>Subject and code: Accounting for Everyone</b> <b>G310OE2.1 (Open Elective Course)</b>
<b>Course Outcomes:</b>
CO1: Analyze various terms used in accounting;
CO2. Make accounting entries and prepare cash book and other accounts necessary while running a business;

CO3. Prepare accounting equation of various business transactions

CO4: Analyze information from company's annual report;

CO5: Comprehend the management reports of the company.

**Subject and code: Financial Literacy**

**G310 OE3.1 (Open Elective Course)**

**Course Outcomes:**

CO1. Describe the importance of financial literacy and list out the institutions providing financial services;

CO2. Prepare financial plan and budget and manage personal finances;

CO3. Open, avail, and manage/operate services offered by banks;

CO4. Open, avail, and manage/operate services offered by post offices;

CO5. Plan for life insurance and property insurance & select instrument for investment in shares

## **Semester- II**

**Subject and code: INTERNATIONAL MANAGEMENT ACCOUNTING**

**G 320 DC1.2**

**Course Outcomes:**

CO1: Explain the nature, source and purpose of management information

CO2: Explain and apply cost accounting techniques

CO3: Prepare budgets for planning and control

CO4: Compare actual costs with standard costs and analyze any variances

CO5: Explain and apply performance measurements and monitor business performance.

**Subject and code: Business Mathematics**

**G 320 DC2.2**

**Course Outcomes:**

CO1: Understand the number system and indices applications in solving basic business problems.

CO2: Apply concept of commercial arithmetic concepts to solve business problems.

CO3: Make use of theory of equation in solving the business problems in the present context.

CO4: Understand and apply the concepts of Set Theory, Permutations & Combinations and Matrices solving business problems.

CO5: Apply measurement of solids in solving simple business problems.

**Subject and code: FINANCIAL REPORTING**

**G 320 DC3.2**

**Course Outcomes:**

CO1: On successful completion of this paper candidates should be able to:

CO2: Discuss and apply a conceptual and regulatory frameworks for financial reporting

CO3: Account for transactions in accordance with International accounting standards

CO4: Analyze and interpret financial statements.

CO5: Prepare and present financial statements for single entities and business combinations in accordance with International accounting standards

**Subject and code : PUBLIC FINANCE**

**G 320 OE1.2**

**Course Outcomes:**

CO1: Identify the basis of Money and sources of Public Finance

CO2: Identify the stages of business cycles and take appropriate decisions.

**Subject and code : Financial Environment**

**G 320 OE 2.2**

**Course Outcomes:**

CO1: Understand the fundamentals of Indian Economy and its significance.

CO2: Evaluate the impact of monetary policy on the stakeholders of the Economy.

CO3: Assess the impact of fiscal policy on the stakeholders of the Economy.

CO4: Examine the status of inflation, unemployment and labour market in India

CO5: Infer the financial sector reforms in India.

**Subject and code : Investing in Stock Markets**

**G 320 OE 3.2 (Open Elective Course)**

<b>Course Outcomes:</b>
<p>CO1: Explain the basics of investing in the stock market, the investment environment as well as risk &amp; return.</p> <p>CO2. Analyze Indian securities market;</p> <p>CO3. Examine EIC framework and conduct fundamental analysis;</p> <p>CO4. Perform technical analysis;</p> <p>CO5. Invest in mutual funds market.</p>
<b>Semester- III</b>
<p><b>Subject and code: AUDIT AND ASSURANCE</b></p> <p><b>G320 DC1.3</b></p>
<b>Course Outcomes:</b>
<p>CO 1: To develop knowledge of auditing techniques</p> <p>CO2: To understand the process of carrying out the assurance engagement</p> <p>CO3: To be able to apply professional regulatory framework.</p>
<p><b>Subject and code: FINANCIAL MANAGEMENT – I</b></p> <p><b>G320 DC2.3</b></p>
<b>Course Outcomes:</b>
<p>CO1: This paper aims at providing the students with the comprehensive understanding of the function of financial management in the context of a business organisation.</p> <p>CO2: The paper expects the students to understand different functions of a financial manager in a globalized environment.</p> <p>CO3: The paper helps the student to understand how well the working capital management can be done in a business.</p> <p>CO4: The paper helps the student to calculate and evaluate the investment appraisal proposal received by the business.</p> <p>CO5: The student will get a in-depth understanding of various special investment decision that a finance manager has to take.</p>
<p><b>Subject and code: PERFORMANCE MANAGEMENT</b></p> <p><b>G320 DC3.3</b></p>

<b>Course Outcomes:</b>
<p>CO1: To develop knowledge and skills in the application of management accounting techniques</p> <p>CO2: To learn the approaches for planning, measuring, controlling, monitoring and evaluation of business performance</p> <p>CO3: To identify and apply budgeting techniques and methods for planning and control</p> <p>CO4: To learn different costing systems to manage the performance of the organisations.</p>
<p><b>Subject and code: GOVERNANCE, RISKS AND ETHICS (Open Elective Course)</b></p> <p><b>G320 OE1.3 (Open Elective Course)</b></p>
<b>Course Outcomes:</b>
<p>CO1: Define governance and explain its function in the effective management and control of organizations and of the resources for which they are accountable.</p> <p>CO2: Evaluate the Professional Accountant's role in internal control, review and compliance.</p> <p>CO3: Explain the role of the accountant in identifying and assessing risk.</p> <p>CO4: Explain and evaluate the role of the accountant in controlling and mitigating risk.</p> <p>CO5: Demonstrate the application of professional values and judgment through an ethical framework that is in the best interests of society and the profession, in compliance with relevant professional codes, laws and regulations.</p>
<p><b>Subject and code: Advertising Skills</b></p> <p><b>G320 OE2.3(Open Elective Course)</b></p>
<b>Course Outcomes:</b>
<p>CO1: Explain types of advertising media.</p> <p>CO2: Identify the factors that affect media selection.</p> <p>CO3: To learn evolve advertising strategy, formulate budget</p> <p>CO4: Understand ethical aspects in advertising</p> <p>CO5: Familiarize online portals in advertising</p>
<p><b>Subject and code: Entrepreneurial skills</b></p> <p><b>G320 OE3.3 (Open Elective Course)</b></p>
<b>Course Outcomes:</b>

CO1: Learn skills to be an effective and capable entrepreneur.
CO2: Comprehend the key factors influencing entrepreneurial possibilities.
CO3: Recognize and creatively think to design and innovate unique business opportunities.
CO4: Understand the skills and knowledge for running and managing a new business.
<b>Semester- IV</b>
<b>Subject and code: Financial Management – II</b> <b>G320 DC1.4</b>
<b>Course Outcomes:</b>
CO1: This paper aims at providing the students with the comprehensive understanding of the function of financial management in the context of various sources of business finances
CO2: The paper aims to provide a deep understanding of the various capital structure theories and how to implement them.
CO3: The paper provides the introduction to various methods by which a business valuation takes place.
CO4: The paper provides various methods by which you can hedge the foreign exchange currency risk.
CO5: The paper provides various methods by which you can hedge the interest rate exposure risk.
<b>Subject and code: Corporate Reporting – I</b> <b>G320 DC2.4</b>
<b>Course Outcomes:</b>
CO1: To underpin the expert knowledge and understanding of the corporate reporting practices in a globalised environment.
CO2: To understand fundamental ethical & professional principles related to corporate reporting.
CO3: To interpret financial statements for different stakeholders.
<b>Subject and code: BUSINESS LAW</b> <b>G320 DC3.4</b>

<b>Course Outcomes:</b>
CO1: To familiarize the students to understand the concept of Business Law CO2: To understand Rules and Regulations associated with it. CO3: To study legal provisions and rules in business CO4: To recognize and identify the extent to which law is important in business
<b>Subject and code: BUSINESS ANALYSIS (OEC)</b> <b>G 320 OE 1.4</b>
<b>Course Outcomes:</b>
CO1: To apply relevant knowledge, skills, and exercise professional judgment in assessing strategic position CO2: To determine strategic choice, and implement strategic action through beneficial business process and structural change; CO3: To coordinate knowledge systems and information technology and by effectively managing processes, projects, and people within financial and other resource constraints.
<b>Subject and code: Business Ethics (Open Elective Course)</b> <b>G 320 OE 2.4</b>
<b>Course Outcomes:</b>
CO1: Understand the basics of ethics CO2: Make a distinction between morality and ethics CO3: Analyze the case studies and make interpretations CO4: Prepare reports based on ethical code of conduct in an organization.
<b>Subject and code: Corporate Governance (Open Elective Course)</b> <b>G 320 OE 3.4</b>
<b>Course Outcomes:</b>
CO1: Analyze fundamental theories of ethics CO2: Make a distinction between morality and ethics CO3: Analyze the case studies and make interpretations CO4: Prepare reports based on ethical code of conduct in an organization.
<b>Subject and code: International Trade (Open Elective Course)</b>

<b>G 320 OE 4.4</b>
<b>Course Outcomes:</b>
<p>CO1: Analysis of trade models in depth in order to discuss the benefits and consequences of international trade and globalization.</p> <p>CO2: The course will slightly delve into international finance in order to discuss different exchange rate regimes, their effect on monetary/fiscal policy, and economic integration.</p> <p>CO3: Understand the legal procedures involved in International Business.</p> <p>CO4: Recognize the different types of economic integrations.</p> <p>CO5: Understand and analyze the operations of MNCs through real case assessment.</p> <p>CO6: Evaluate India's foreign trade status</p>
<b>Semester- V ( CBCS)</b>
<b>Subject and code:      Corporate Reporting - II</b>
<b>Course Outcomes:</b>
<p>CO1 : Reporting of financial performance</p> <p>CO2: Group financial statements including group cash flow statements and accounting for associates &amp; joint arrangements</p> <p>CO3: Accounting for changes in group structures</p> <p>CO4: Foreign transactions &amp; entities</p>
<b>Subject and code:      INTERNATIONAL BUSINESS</b>
<b>Course Outcomes:</b>
<p>CO1 : To study the international trade and business variables in economies</p> <p>CO2: To understand India's composition and direction of foreign trade.</p> <p>CO3: To provide a framework for consistent reasoning about International flows of goods, factors of production.</p>
<b>Subject and code:      Advanced Performance Management – I</b>
<b>Course Outcomes:</b>
<p>CO1 : Use of strategic planning and control models in planning and monitoring business performance</p> <p>CO2: Assessing key external influences on an organisation</p> <p>CO3: Changes in business structure and performance management</p>

C04: Designing management information systems
<b>Subject and code: BUSINESS LAW</b>
<b>Course Outcomes:</b>
CO1 : To familiarize the students to understand the concept of Business Law CO2: To understand Rules and Regulations associated with it. CO3: To practically apply legal rules in business CO4: To recognize and identify the extent to which law is important in business dealings.
<b>Subject and code: Advanced Financial Management - I</b>
<b>Course Outcomes:</b>
CO1 : Understand the role of a senior financial advisor in global environment against the backdrop of ethical framework and governance CO2: Finance function in a multi-national organisation CO3: Financial evaluation of mergers & acquisitions for the stakeholders, particularly the shareholders CO4: Financial evaluation of business reorganisation and financial reconstruction
<b>Subject and code: Business Taxation</b>
<b>Course Outcomes:</b>
CO1 : To expose the students with corporate taxation in India and assessment procedure thereof. CO2: To get an overview of assessment of income of Non-corporate assessees.
<b>Semester- VI</b>
<b>Subject and code: MODERN BANKING OPERATIONS</b>
<b>Course Outcomes:</b>
CO1 : Students is familiarized in detail the concepts of Banking. CO2: Understand the legal aspects of Banking Regulation Act. CO3: Learner become aware about recent developments in banking sector. CO4: Students gets an overview of the International Banking Management
<b>Subject and code: FOREIGN EXCHANGE MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1 : To understand the Foreign Exchange Department of a Bank in facilitating the foreign trade. CO2: To know the role of government in solving problems of International Business

<b>Subject and code:</b>	<b>Advanced Financial Management – II</b>
<b>Course Outcomes:</b>	
	CO1 : Using advanced investment appraisal techniques& estimating cost of capital CO2: Financing of investment including international investments CO3: Advanced risk management techniques CO4: Mergers and acquisitions Mergers and acquisitions
<b>Subject and code:</b>	<b>Corporate Law and Governance</b>
<b>Course Outcomes:</b>	
	CO1: To understand the concept of Corporate Law CO2: To understand the legal provisions associated with the Companies Act 2013. CO3: To have an overview of the formation of the company CO4: To understand the practical application of corporate law in companies.
<b>Subject and code:</b>	<b>Advanced Performance Management – II</b>
<b>Course Outcomes:</b>	
	CO1: Applying strategic performance measurement in private sector organisations CO2: Divisional performance & transfer pricing issues CO3: Strategic performance measures in not-for-profit organisations CO4: Alternative views of performance measurement & management
<b>Subject and code:</b>	<b>SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT</b>
<b>Course Outcomes:</b>	
	CO1: To help the students understand the conceptual framework of security CO2:To help the students to understand the risk involved in security market CO3: To study fundamental and technical analysis by the investor CO4: To understand various aspects of share and bond valuation.

<b>Department Name:</b>	<b>G 300 E B. Com (APPRENTICESHIP/ INTERNSHIP EMBEDDED)</b>
<b>PROGRAMME OUTCOMES</b>	
P01: Students will be able to get hands on experience in dealing with computerized accounting systems in the corporate organisations.	
P02: Students will be able to effectively present accounting data within and outside the	

organisations.

PO3: Students will be able to interpret the real time data with actual business environment.

PO4: Students will demonstrate accounting skills with the help of accounting software.

PO5: Students will be able to prepare and furnish final financial statements as required by various authorities for statutory purposes.

PO6: Learning environmental issues, students will show sensitivity towards sustainability and ecology in corporate organisations.

PO7: Students will have the ability to keep updating technical knowledge and will be exposed to corporates through apprenticeship for a period of six months.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO1: Understand the nature and basic Industry based concepts like accounting for business processes, Insurance for business processes, computer applications in businesses.

PSO2: Analyze Accounting procedures involved in payments and receipts from customers, banking institutions etc., which required in maintaining the books of accounts for various business processes.

PSO3: Determine the outcomes of the inventory management and learn the ways to implement ERP effectively and efficiently.

PSO4: Understand the nature of Corporate world and learn the required corporate behaviours in order to blend with the culture of the corporates while they take up apprenticeships.

#### **Semester- I**

**Subject and code: FINANCIAL ACCOUNTING – I**  
**G 330 DC1.1**

#### **Course Outcomes:**

CO – 1: Understand the basic concept, principles and process of Accounting

CO – 2: Acquire the basics of Business Excel and able to record the data in excel sheet

CO – 3: Able to pass accounting entries, prepare ledger and trial balance

CO - 4: Record independently receipts and payments and analyze the receipts and payments

**Subject and code: Purchase and Sales Accounting Process**

**G 330 DC2.1**

**Course Outcomes:**

CO – 1: Acquire the knowledge of purchase process

CO – 2: Understand ERP software and record the purchase and payments in ERP software

CO – 3: Able to record purchase journal and record payments.

CO -4: Able to perform banking process, letter of intimation, manual outgoing payment, and Automatic Payment Process (APP).

**Subject and code: Principles of Marketing**

**G 330 DC3.1**

**Course Outcomes:**

CO1: Understand the basic concepts of marketing and assess the marketing environment.

CO2: Analyze the consumer behaviour in the present scenario and marketing segmentation.

CO3: Discover the new product development & identify the factors affecting the price of a product in the present context.

CO4: Judge the impact of promotional techniques on the customers & importance of channels of distribution.

CO5: Outline the recent developments in the field of marketing.

**Subject and code: Managerial Economics**

**G 330 OE1.1**

**Course Outcomes:**

CO1: Describe the importance of managerial economics in decision making process.

CO2. Learners would be able to apply the concepts and principles in their day to day life.

CO3. Analyze how economic agents make decisions and choices using theoretical knowledge & practical approach.

**Subject and code: Accounting for Everyone**

<b>G 330 OE1.1</b>
<b>Course Outcomes:</b>
CO1: Analyze various terms used in accounting; CO2. Make accounting entries and prepare cash book and other accounts necessary while running a business; CO3. Prepare accounting equation of various business transactions CO4: Analyze information from company's annual report; CO5: Comprehend the management reports of the company.
<b>Semester- II</b>
<b>Subject and code: FINANCIAL ACCOUNTING II</b> <b>G330 DC1.2</b>
<b>Course Outcomes:</b>
CO - 1: Understand the meaning and objective of Bank Reconciliation. CO - 2: Understand the process of reconciliation and preparation of reconciliation statement CO - 3: Understand the concept depreciation and purpose of charging depreciation CO – 4: Able to prepare depreciation work sheet and maintain records for income tax purpose.
<b>Subject and code : Inventory Valuation</b> <b>G330 DC2.2</b>
<b>Course Outcomes:</b>
CO – 1: Understand the role of ERP Software in Inventory Management CO – 2: Know record keeping of inventory, preparation of chart of accounts and inventory Master Data Sheet. CO – 3: Able to record inventory and prepare master data sheet of inventory CO - 4: They can maintain inventory records and documents for audit purpose
<b>Subject and code : Banking, Financial services and Insurance</b> <b>G330 DC3.2</b>
<b>Course Outcomes:</b>

<p>CO – 1: Students will have clear understanding of the concepts and operations of banks, financial services and insurance companies</p> <p>CO – 2: Get knowledge in Regulatory framework of Banks and Insurance companies</p> <p>CO – 3: Understand the various banking and insurance products and financial services offered and their implications while attending apprenticeship.</p>
<p><b>Subject and code : PUBLIC FINANCE</b></p> <p><b>G 330 OE1.2 (Open Elective Course)</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO1: Identify the basis of Money and sources of Public Finance</p> <p>CO2: Understand the components of Public Finance</p> <p>CO3: Identify the stages of business cycles and take appropriate decisions</p> <p>CO4: acquaint with the knowledge of fiscal policy of the government.</p>
<p style="text-align: center;"><b>Semester- III</b></p>
<p><b>Subject and code: Corporate Accounting</b></p> <p><b>G330 DC1.3</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO 1: Able to configure enterprise structure based on statutes in ERP</p> <p>CO 2: Able to set Accounting Global parameters in ERP system</p> <p>CO 3: Know how to work with Business transaction and reconciliations</p> <p>CO 4: To process banking operations from MNC's accounting environment</p> <p>CO 3: To know the changes in accounting regulations and adoption of IFRS</p>
<p><b>Subject and code: Business Statistics</b></p> <p><b>G330 DC2.3</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO1: Identify a statistical method for solving practical problems.</p> <p>CO2: Discuss critically the uses and limitation of statistical techniques.</p> <p>CO3: Describe and discuss the key terminology, concepts, tools and techniques used in business statistical analysis.</p>

CO4: Evaluate critically the underlying assumptions of analysis tools.
<b>Subject and code: PAYROLL MANAGEMENT &amp; SOFTWARE</b> <b>G330 DC3.3</b>
<b>Course Outcomes:</b>
CO 1: Students will be able to define payroll management CO 2: Understand payroll work process and define HR Policies of the Organization. CO 3: Students will be able to prepare payroll period and Salary Structure. CO 4: Students will be able work on software relating to payroll accounting.
<b>Subject and code Entrepreneurial skills</b> <b>G3300E1.3 (Open Elective Course)</b>
<b>Course Outcomes:</b>
CO1: Learn skills to be an effective and capable entrepreneur. CO2:Comprehend the key factors influencing entrepreneurial possibilities. CO3:Recognize and creatively think to design and innovate unique business opportunities. CO4: Understand the skills and knowledge for running and managing a new business
<b>Subject and code: Advertising Skills</b> <b>G3300E2.3(Open Elective Course)</b>
<b>Course Outcomes:</b>
CO1: Explain types of advertising media. CO2: Identify the factors that affect media selection. CO3: To learn evolve advertising strategy, formulate budget CO4: Understand ethical aspects in advertising CO5: Familiarize online portals in advertising
<b>Subject and code: Modern Bank Management</b> <b>G 330 OE 3.3 (Open Elective Course)</b>
<b>Course Outcomes:</b>
CO 1: Have clear understanding of the concepts and operations of modern banks CO 2: Get knowledge in functions of RBI and other banks. CO 3: Understand various modern banking products and services offered.

Semester- IV
<b>Subject and code: Advanced Corporate Accounting</b> <b>G330 DC1.4</b>
<b>Course Outcomes:</b>
CO 1: Able to configure customer master data on ERP CO 2: Able to set Accounting Global parameters in ERP system CO 3: Know how to work with Business transaction and reconciliations sundry debtor base CO 4: To process banking operations from MNC's A/R environment CO 5: To know the interest calculation techniques
<b>Subject and code: Costing Methods &amp; Techniques</b> <b>G330 DC2.4</b>
<b>Course Outcomes:</b>
CO 1: Understand the basic concept of Costing Accounting CO 2: Acquire the basics of Cost Elements, Cost Centre CO 3: Able to pass accounting entries, prepare ledger and trial balance CO 4: Record independently receipts and payments and analyze the receipts and payments
<b>Subject and code: Business Regulatory Framework</b> <b>G330DC3.4</b>
<b>Course Outcomes:</b>
CO1:Understand the concept of Business Regulatory Framework CO2:Able to apply the Rules and Regulations associated with business CO3:Ability to understand the legal provisions to enter into contract CO4: Recognize and identify the extent to which law is important in business dealings.
<b>Subject and code: Business Ethics (Open Elective Course)</b> <b>G330 OE 1.4</b>
<b>Course Outcomes:</b>
CO1: Understand the basics of ethics CO2: Make a distinction between morality and ethics CO3: Analyze the case studies and make interpretations

CO4: Prepare reports based on ethical code of conduct in an organization.
<b>Subject and code: Corporate Governance(Open Elective Course)</b> <b>G330 OE 2.4</b>
<b>Course Outcomes:</b>
CO1: Analyze fundamental theories of ethics CO2: Make a distinction between morality and ethics CO3: Analyze the case studies and make interpretations CO4: Prepare reports based on ethical code of conduct in an organization.
<b>Subject and code: International Trade (Open Elective Course)</b> <b>G330 OE 3.4</b>
<b>Course Outcomes:</b>
CO1: Analysis of trade models in depth in order to discuss the benefits and consequences of international trade and globalization. CO2: The course will slightly delve into international finance in order to discuss different exchange rate regimes, their effect on monetary/fiscal policy, and economic integration. CO3: Understand the legal procedures involved in International Business. CO4: Recognize the different types of economic integrations. CO5: Understand and analyze the operations of MNCs through real case assessment. CO6: Evaluate India's foreign trade status

<b>Department Name:</b>	<b>G 400 A B.B.A.</b>
<b>PROGRAMME OUTCOMES</b>	
PO1: Understand concepts and principles of management/business; identify the opportunities in the corporate environment and manage the challenges. PO2: Demonstrate the knowledge of management science to solve complex corporate problems using limited resources. Display enhanced personality and soft skills. PO3: Function effectively as an individual, and as a member or leader in diverse teams,	

and in multidisciplinary settings.

PO4: Demonstrate entrepreneurial competencies.

PO5: Exhibit managerial skills in the areas of marketing, finance, HR, etc.

PO6: Identify business opportunities, design and implement innovations in workspace.

PO7: Possess a sturdy foundation for higher education.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO1: Acquire practical learning through summer internship, industrial visit and Business Plan etc.

PSO2: Demonstrate analytical and problem-solving skills through specialization in Finance, Human Recourse, and Marketing to solve the business issues.

PSO3: Understand and develop the new dimensions of knowledge through open electives to cater the need of the industry.

PSO4: Comprehend the core concepts, methods and practices in management.

PSO5: Venture into his/her own business or excel in executive roles in private/government sector.

PSO6: Demonstrate the ability to create business plans.

PSO7: Develop an understanding of business that reflects the moral responsibility of business to all relevant stakeholders and the natural environment.

PSO8: Matured Individuals and responsible Citizens to the country.

PSO9: Demonstrate Ability to work in Groups.

#### **Semester- I**

**Subject and code : Management Principles & Practice**

**Course Code: 401 DC1.1**

#### **Course Outcomes:**

CO1: The ability to understand concepts of business management, principles and function of management.

CO2: The ability to explain the process of planning and decision making.

CO3: The ability to create organization structures based on authority, task and responsibilities.

CO4: The ability to explain the principles of direction, importance of communication, barrier of communication, motivation theories and leadership styles.

CO5: The ability to understand the requirement of good control system and control techniques.

**Subject and code: Fundamentals of Business Accounting**

Course Code: G 401 DC2.1

**Course Outcomes:**

CO1: Understand the framework of accounting as well accounting standards.

CO2: Ability to analyse journal entry and Prepare Ledger account.

CO3: Ability to prepare subsidiary books and bank reconciliation statement.

CO4: Ability to prepare Trial Balance and final accounts of proprietary concern

CO5: Understand the basic framework of tally and construct final accounts through application of tally.

**Subject and code: Marketing Management**

**Course Code: G 401 DC 3.1**

**Course Outcomes:**

CO1: Understand the concepts and functions of marketing.

CO2: Analyse marketing environment impacting the business.

CO3: Segment the market and understand the consumer behaviour

CO4: Describe the 4 Ps of marketing and also strategize marketing mix

CO5: Describe 7 Ps of service marketing mix.

**Subject and code: Managerial Economics**

**G310OE1.1**

**Course Outcomes:**

CO1: Describe the importance of managerial economics in decision making process.

CO2. Learners would be able to apply the concepts and principles in their day to daylife.

CO3. Analyze how economic agents make decisions and choices using theoretical knowledge & practical approach.

**Subject and code: Business Organization**

**Course Code: G 401 OE1.1**

**Course Outcomes:**

CO1: An understanding of the nature, objectives and social responsibilities of business

CO2: An ability to describe the different forms of organisations

CO3: An understanding of the basic concepts of management  
CO4: An understanding of functions of management.  
CO5: An understanding of different types of business combinations.

**Subject and code: Office Organization and Management (OEC)**

**Course Code: G 401 OE 2.1**

**Course Outcomes:**

CO1. An understanding of basic knowledge of office organisation and management  
CO2: Demonstrate skills in effective office organisation  
CO3: Ability to maintain office records  
CO4: Ability to maintain digital record.  
CO5: Understanding of different types of organisation structures and responsibilities as future office managers.

**Subject and code: BASIC ECONOMICS (OE)**

**Course Code: G 401 OE 3.1**

**Course Outcomes:**

CO1. Explain how consumers make rational choices using the concept of utility  
CO2: To understand the concept of consumer surplus.  
CO3: Analyse the factors that affect market demand and market supply and illustrate their interaction for achieving equilibrium in price and quantity.  
CO4: Analyse how producer applies the marginal decision rule to maximize the profit in producing goods or services..

## **Semester- II**

**Subject and code: Corporate Accounting and Reporting**

**Course Code: G 401 DC 2.2**

**Course Outcomes:**

CO1: The ability to understand the process of public issue of shares, alteration of shares and accounting for the same  
CO2: The ability to prepare final accounts of joint stock companies.

CO3: The ability to understand different ways of valuing corporate shares and goodwill.

CO4: The ability to prepare and evaluate vertical and horizontal analysis of financial statements and the skill of preparing financial reports,

CO5: The ability to understand company's annual reports.

**Subject and code: Human Resource Management**

**Course Code: G401 DC 1.2**

**Course Outcomes:**

CO1: To describe the role and responsibility of Human resource management functions on business and also to understand the recent trends in HR practices.

CO2: To understand the concepts such as HRP, Recruitment and Selection process HR Demand Forecasting, HR supply forecasting, Job Analysis, Specification, Job Enlargement, Job Rotation, Job Enrichment, Psychometric tests for Selection.

CO3: To infuse the concept of induction, training and compensation aspects.

CO4: To explain the concepts of performance appraisal and its process. Also explain the concepts of Right Sizing of Work Force, Need for Right Sizing.

CO5: To demonstrate Employee Engagement and Psychological Contract, Employee Engagement (EE): Drivers of Engagement -Measurement of EE, Benefits of EE.

**Subject and code : BUSINESS ENVIRONMENT**

**Course Code: G401 DC 3.2**

**Course Outcomes:**

CO1: An Understanding of components of business environment.

CO2: Ability to analyse the environmental factors influencing business organisation.

CO3: Ability to demonstrate Competitive structure analysis for select industry.

CO4: Ability to explain the impact of fiscal policy and monetary policy on business.

CO5: Ability to analyse the impact of economic environmental factors of business..

**Subject and code : Business Mathematics**

**Course Code: G 401 DC 4.2**

**Course Outcomes:**

CO1: The Understanding of the basic concepts of business math and apply them to create solve and interpret application problems in business

CO2: Ability to solve problems on various types of equation.

CO3: Ability to solve problems on Matrices and execute the laws of indices, law of logarithm and evaluate them.

CO4: Ability to apply the concept of simple interest and compound interest bills discounted etc. and apply them in day-to-day life.

CO5: Ability to solve problems on Arithmetic progression, Geometric progression and construct logical application of these concepts.

**Subject and code : People Management**

**Course Code: G 401 0E 1.2**

**Course Outcomes:**

CO1: Ability to examine the difference between People Management with Human resource Management

CO2. Ability to explain the need for and importance of People Management.

CO3. Ability to explain role of manager in different stages of performance management process

CO4. Ability to list modern methods of performance and task assessment.

CO5. Ability to analyse the factors influencing the work life balance of an working individual.

**Subject and code : RETAIL MANAGEMENT**

**Course Code: G401 OE 2.2**

**Course Outcomes:**

CO1. An understanding of the types and forms of Retail business, Analysis of Retail life cycle. Also help understand the factors influencing present Indian retail scenario.

CO2: Ability to examine Consumer Behaviour in various environments and its implication on retailing.

CO3: Ability to analyse various Retail operations and evaluate them, also understand the concepts of Market area analysis, Trade area analysis, Rating Plan method and Site evaluation.

CO4: Ability to analyse various marketing mix elements in retail operations including Supply channel – SCM principles – Retail logistics – computerized replenishment system – corporate replenishment policies

CO5: Understand the workings of Integrated systems and networking – EDI – Bar coding – Electronic article surveillance – Electronic shelf labels – Customer database management

system.

**Subject and code : MANAGERIAL ECONOMICS (OE)**

**Course Code: G401 OE 3.2**

**Course Outcomes:**

CO1: To know the basic knowledge of managerial economics.

CO2: To understand the dynamics of business.

CO3: To know about the managerial concept of business

CO4: Helps the consumers and producers to take apt decisions;

**Semester- III**

**Subject and code: COST ACCOUNTING**

**Course Code: G 401. DC 1.3**

**Course Outcomes:**

CO 1 Understand the elements of costing and preparation of cost sheet.

CO2: The ability to prepare material requisitions and management of store.

CO3: The ability to compare and contrast labour /employee cost techniques.

CO4: Ability to differentiate kinds of overhead costing.

CO5: Ability to reconcile the cost.

**Subject and code: ORGANIZATIONAL BEHAVIOR**

**Course Code: G 401. DC 2.3**

**Course Outcomes:**

CO1: To recall role of OB in business organization.

CO2: Able to understand group dynamics in an organization.

CO3: Able to understand the change management.

CO4: Able to construct the process of organizational development.

CO5: Ability to understand the kinds of Interventions in OB.

**Subject and code: Statistics for Business Decisions**

**Course Code: G 401 OE 1.3**

**Course Outcomes:**

CO 1: Define social media marketing goal setting for successful online campaigns.

CO2: Analyze the effective social media marketing strategies for various types of industries and businesses.
CO3: Design social media content and create strategies to optimize the content's reach to the target audience.
CO4: Appraise the reach and track progress in achieving social media objectives with a variety of measurement tools and metrics.
CO5: Design a suitable social media campaign for the business goals.

**Subject and code: Rural Marketing (OEC)**

**Course Code: G 401 OE 2.3**

**Course Outcomes:**

CO1: Describe the importance and application of various concepts of rural marketing.
CO2: demonstrate the appropriate selection of the segmentation, targeting and positioning strategies along with the environmental factors that influence rural consumers's buying behavior.
CO3: Design a Pricing Strategy that suits the characteristics of rural products and the stage in the product life cycle.
CO4: Formulate the appropriate marketing communication and rural distribution channel plans to promote and deliver the rural products.
CO5: Appraise the recent trends in Rural marketing and the application of digital technology in rural marketing.

**Subject and code: MONEY AND PUBLIC FINANCE –OPEN ELECTIVE**

**Course Code: G401 OE 3.3**

**Course Outcomes:**

CO1: Understand the meaning of public finance or government finance; its nature, subject matter, explain the differences between public finance and private finance and differentiate between the public and private goods
CO2: Classify the public revenue and its various sources; revenue receipts and non-revenue receipts, understand the tax and no-tax revenues, the causes of increasing public expenditure in the modern economies
CO3: Explain the varying effects of public expenditure on the economy and role of public expenditure in a developing economy

CO4: Understand the various sources of government borrowing and the reasons behind the growing public debt, describe how the debt is repaid, the role of public debt in developing countries.

**Semester- IV**

**Subject and code: MANAGEMENT ACCOUNTING**

**Course Code: G 401 DC 1.4**

**Course Outcomes:**

CO1: Able to understand the concept of Management Accounting.

CO2: To Understand and recall ratios and apply the same on given case.

CO3: To construct cash flow statement.

CO4: Should be able to apply Marginal cost ratios to make business decisions.

CO5: Student should be able to analyze business problems through applications.

**Subject and code: Business Analytics**

**Course Code: G 401 DC 2.4**

**Course Outcomes:**

CO1: Able to understand Data Types and storage of Data.

CO2: To understand types of analytics and data models.

CO3: To demonstrate visualization of data.

CO4: To recall the data mining and processing of data.

CO5: Able to understand concepts of different analytics model.

**Subject and code: Financial Markets & Services**

**Course Code: G 401 DC 3.4**

**Course Outcomes:**

CO1: To able to recall concepts of financial system.

CO2: Able to differentiate the roles of financial institutions.

CO3: Able understand concept of financial services.

CO4: To understand the trading process of Instruments.

CO5: Able to Summarize the concept of stock market.

**Subject and code: FINANCIAL MANAGEMENT**

<b>Course Code: G 401 DC 4.4</b>
<b>Course Outcomes:</b>
CO1: To identify the goals of financial management. CO2: To appraise the concepts of time value of money. CO3: To understand the different models of dividend policy. CO4: Able to analyze the business problem related to investments. CO5: Able to appraise the working capital requirements in an organization.
<b>Semester- V</b>
<b>Subject and code: COST ACCOUNTING</b>
<b>Course Outcomes:</b>
CO1: To familiarize students with various cost accounting concepts, objectives, process, elements of cost and cost audit.
<b>Subject and code: ADVANCED MANAGEMENT ACCOUNTING (CIMA)</b>
<b>Course Outcomes:</b>
CO1: Focusing primarily on the long term, advanced management accounting builds on the insights about costs and their drivers (from management Accounting) to provide the competencies needed to analyse plan and manage costs to support the implementation of the organisation's strategy.  CO2: It shows how to manage and control the performance of various MODULE s of the organisation in line with both short-term budgets and long-term strategy.
<b>Subject and code: OPERATIONS MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1: To acquaint basic knowledge in operations techniques to the students.
<b>Subject and code: ADVANCED TAXATION- I</b>
<b>Course Outcomes:</b>
CO1: To acquaint students with knowledge about Direct Tax laws pertaining to various assesses with latest amendments

<b>Subject and code:</b> <b>AUDITING</b>
<b>Course Outcomes:</b>
CO1: To familiarise the students with the scope, objectives, procedures and techniques of audit.
<b>Subject and code:</b> <b>ORGANISATIONAL BEHAVIOUR</b>
<b>Course Outcomes:</b>
CO1: To understand the various components of human behaviour and its impact on the business organizations
<b>Semester- VI</b>
<b>Subject and code:</b> <b>COST AND MANAGEMENT ACCOUNTING</b>
<b>Course Outcomes:</b>
<b>CO1:</b> To familiarize the students on the use of cost accounting methods and techniques in different nature of businesses and its application for managerial decision making.
<b>Subject and code:</b> <b>FINANCIAL STRATEGY (CIMA)</b>
<b>Course Outcomes:</b>
CO1: : Financial Strategy focuses on the formulation and implementation of financial strategy to support the overall strategy of the organisation. Using insights gained from Financial Reporting and Taxation and Advanced Financial Reporting, it provides the competencies to evaluate the financing requirements of organisations and the relative merits of alternative sources of finance to meet these requirements
<b>Subject and code:</b> <b>INVESTMENT MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1: To acquaint the students regarding the fundamentals of investment and to assess the investment opportunities available in the Indian market.
<b>Subject and code:</b> <b>ADVANCED TAXATION- II</b>
<b>Course Outcomes:</b>
To acquaint student's with basic knowledge on Goods and Services taxes and customs law in India

<b>Subject and code: LOGISTICS AND SUPPLY CHAIN MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1: Students will explore the key issues associated with the design and management of supply chain and logistics functions.
<b>Subject and code: ENTREPRENEURSHIP DEVELOPMENT</b>
<b>Course Outcomes:</b>
CO1: To inculcate an understanding of the concept of entrepreneurship and to give a direction for the budding entrepreneurs to start up their own venture.
<b>Subject and code: ADVANCED FINANCIAL MANAGEMENT –II</b>
<b>FINANCIAL STATEMENT ANALYSIS</b>
<b>Course Outcomes:</b>
CO1: To acquaint the students with tools, techniques and importance of financial statements in managerial decision making.
<b>Subject and code: INDUSTRIAL RELATIONS AND LABOUR WELFARE</b>
<b>Course Outcomes:</b>
CO1: To understand the concept of industrial relations and provide a frame work for analysis of the industrial problems. It also helps to familiarise students with the mechanism adapted by many industries to settle the problems through the machinery provided by the legislation.
<b>Subject and code: ADVERTISING MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1: To give an insight to the students about the field of advertising practices that is commonly followed to make marketing effective through advertisement.
<b>Subject and code: STRATEGIC MANAGEMENT (CIMA)</b>
<b>Course Outcomes:</b>
CO1: It aims at implementing the strategies by aligning their structures, people, process, projects and relationships. It aims to develop skills and abilities of the strategic leaders of organizations, enabling them to create the vision and direction for the growth and long term sustainable success of the organization. It focuses on successfully managing and

leading change within the process of strategy formulation and implementation

<b>Department Name:</b>	<b>G 400 C B.B.A. (Professionals)</b>
<b>PROGRAMME OUTCOMES</b>	
PO1: Understand concepts and principles of management/business; identify the opportunities in the corporate environment and manage the challenges. PO2: Demonstrate the knowledge of management science to solve complex corporate problems using limited resources. Display enhanced personality and soft skills. PO3: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. PO4: Demonstrate entrepreneurial competencies. PO5: Exhibit managerial skills in the areas of marketing, finance, HR, etc. PO6: Identify business opportunities, design and implement innovations in workspace. PO7: Possess a sturdy foundation for higher education.	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
PSO1: Acquire practical learning through summer internship, industrial visit and Business Plan etc. PSO2: Demonstrate analytical and problem-solving skills through specialization in Finance, Human Recourse, and Marketing to solve the business issues. PSO3: Understand and develop the new dimensions of knowledge through open electives to cater the need of the industry. PSO4: Comprehend the core concepts, methods and practices in management. PSO5: Venture into his/her own business or excel in executive roles in private/government sector. PSO6: Demonstrate the ability to create business plans. PSO7: Develop an understanding of business that reflects the moral responsibility of business to all relevant stakeholders and the natural environment. PSO8: Matured Individuals and responsible Citizens to the country. PSO9: Demonstrate Ability to work in Groups.	

Semester- I
<b>Subject and code : Management Principles &amp; Practice</b> <b>Course Code: 401 DC1.1</b>
<b>Course Outcomes:</b>
CO1:The ability to understand concepts of business management, principles and function of management. CO2:The ability to explain the process of planning and decision making. CO3: The ability to create organization structures based on authority, task and responsibilities. CO4: The ability to explain the principles of direction, importance of communication, barrier of communication, motivation theories and leadership styles. CO5: The ability to understand the requirement of good control system and control techniques.
<b>Subject and code: Fundamentals of Business Accounting</b> <b>Course Code: G 401 DC2.1</b>
<b>Course Outcomes:</b>
CO1: Understand the framework of accounting as well accounting standards. CO2: Ability to analyse journal entry and Prepare Ledger account. CO3: Ability to prepare subsidiary books and bank reconciliation statement. CO4: Ability to prepare Trial Balance and final accounts of proprietary concern CO5: Understand the basic framework of tally and construct final accounts through application of tally.
<b>Subject and code: Marketing Management</b> <b>Course Code: G 401 DC 3.1</b>
<b>Course Outcomes:</b>
CO1: Understand the concepts and functions of marketing. CO2: Analyse marketing environment impacting the business. CO3: Segment the market and understand the consumer behaviour CO4: Describe the 4 Ps of marketing and also strategize marketing mix CO5: Describe 7 Ps of service marketing mix.

**Subject and code: Managerial Economics**

**G310OE1.1**

**Course Outcomes:**

CO1: Describe the importance of managerial economics in decision making process.

CO2. Learners would be able to apply the concepts and principles in their day to daylife.

CO3. Analyze how economic agents make decisions and choices using theoretical knowledge & practical approach.

**Subject and code: Business Organization**

**Course Code: G 401 OE1.1**

**Course Outcomes:**

CO1: An understanding of the nature, objectives and social responsibilities of business

CO2: An ability to describe the different forms of organisations

CO3: An understanding of the basic concepts of management

CO4: An understanding of functions of management.

CO5: An understanding of different types of business combinations.

**Subject and code: Office Organization and Management (OEC)**

**Course Code: G 401 OE 2.1**

**Course Outcomes:**

CO1. An understanding of basic knowledge of office organisation and management

CO2: Demonstrate skills in effective office organisation

CO3: Ability to maintain office records

CO4: Ability to maintain digital record.

CO5: Understanding of different types of organisation structures and responsibilities as future office managers.

**Subject and code: BASIC ECONOMICS (OE)**

**Course Code: G 401 OE 3.1**

**Course Outcomes:**

CO1. Explain how consumers make rational choices using the concept of utility

CO2: To understand the concept of consumer surplus.

CO3: Analyse the factors that affect market demand and market supply and illustrate their interaction for achieving equilibrium in price and quantity.

CO4: Analyse how producer applies the marginal decision rule to maximize the profit in producing goods or services..

## **Semester- II**

**Subject and code: Corporate Accounting and Reporting**

**Course Code: G 401 DC 2.2**

### **Course Outcomes:**

CO1: The ability to understand the process of public issue of shares, alteration of shares and

accounting for the same

CO2: The ability to prepare final accounts of joint stock companies.

CO3: The ability to understand different ways of valuing corporate shares and goodwill.

CO4: The ability to prepare and evaluate vertical and horizontal analysis of financial statements and the skill of preparing financial reports,

CO5: The ability to understand company's annual reports.

**Subject and code: Human Resource Management**

**Course Code: G401 DC 1.2**

### **Course Outcomes:**

CO1: To describe the role and responsibility of Human resource management functions on business and also to understand the recent trends in HR practices.

CO2: To understand the concepts such as HRP, Recruitment and Selection process HR Demand Forecasting, HR supply forecasting, Job Analysis, Specification, Job Enlargement, Job Rotation, Job Enrichment, Psychometric tests for Selection.

CO3: To infuse the concept of induction, training and compensation aspects.

CO4: To explain the concepts of performance appraisal and its process. Also explain the concepts of Right Sizing of Work Force, Need for Right Sizing.

CO5: To demonstrate Employee Engagement and Psychological Contract, Employee Engagement (EE): Drivers of Engagement -Measurement of EE, Benefits of EE.

**Subject and code : BUSINESS ENVIRONMENT**

**Course Code: G401 DC 3.2****Course Outcomes:**

CO1: An Understanding of components of business environment.

CO2: Ability to analyse the environmental factors influencing business organisation.

CO3: Ability to demonstrate Competitive structure analysis for select industry.

CO4: Ability to explain the impact of fiscal policy and monetary policy on business.

CO5: Ability to analyse the impact of economic environmental factors of business..

**Subject and code : Business Mathematics****Course Code: G 401 DC 4.2****Course Outcomes:**

CO1: The Understanding of the basic concepts of business math and apply them to create solve and interpret application problems in business

CO2: Ability to solve problems on various types of equation.

CO3: Ability to solve problems on Matrices and execute the laws of indices, law of logarithm and evaluate them.

CO4: Ability to apply the concept of simple interest and compound interest bills discounted etc. and apply them in day-to-day life.

CO5: Ability to solve problems on Arithmetic progression, Geometric progression and construct logical application of these concepts.

**Subject and code : People Management****Course Code: G 401 0E 1.2****Course Outcomes:**

CO1: Ability to examine the difference between People Management with Human resource Management

CO2. Ability to explain the need for and importance of People Management.

CO3. Ability to explain role of manager in different stages of performance management process

CO4. Ability to list modern methods of performance and task assessment.

CO5. Ability to analyse the factors influencing the work life balance of an working individual.

**Subject and code : RETAIL MANAGEMENT**

<b>Course Code: G401 OE 2.2</b>
<b>Course Outcomes:</b>
<p>CO1. An understanding of the types and forms of Retail business, Analysis of Retail life cycle. Also help understand the factors influencing present Indian retail scenario.</p> <p>CO2: Ability to examine Consumer Behaviour in various environments and its implication on retailing.</p> <p>CO3: Ability to analyse various Retail operations and evaluate them, also understand the concepts of Market area analysis, Trade area analysis, Rating Plan method and Site evaluation.</p> <p>CO4: Ability to analyse various marketing mix elements in retail operations including Supply channel – SCM principles – Retail logistics – computerized replenishment system – corporate replenishment policies</p> <p>CO5: Understand the workings of Integrated systems and networking – EDI – Bar coding – Electronic article surveillance – Electronic shelf labels – Customer database management system.</p>
<b>Subject and code : MANAGERIAL ECONOMICS (OE)</b>
<b>Course Code: G401 OE 3.2</b>
<b>Course Outcomes:</b>
<p>CO1: To know the basic knowledge of managerial economics.</p> <p>CO2: To understand the dynamics of business.</p> <p>CO3: To know about the managerial concept of business</p> <p>CO4: Helps the consumers and producers to take apt decisions;</p>
<b>Semester- III</b>
<b>Subject and code: COST ACCOUNTING</b>
<b>Course Code: G 401. DC 1.3</b>
<b>Course Outcomes:</b>
CO 1 Understand the elements of costing and preparation of cost sheet.

CO2: The ability to prepare material requisitions and management of store.  
 CO3: The ability to compare and contrast labour /employee cost techniques.  
 CO4: Ability to differentiate kinds of overhead costing.  
 CO5: Ability to reconcile the cost.

**Subject and code: ORGANIZATIONAL BEHAVIOR**

**Course Code: G 401. DC 2.3**

**Course Outcomes:**

CO1: To recall role of OB in business organization.  
 CO2: Able to understand group dynamics in an organization.  
 CO3: Able to understand the change management.  
 CO4: Able to construct the process of organizational development.  
 CO5: Ability to understand the kinds of Interventions in OB.

**Subject and code: Statistics for Business Decisions**

**Course Code: G 401 OE 1.3**

**Course Outcomes:**

CO 1: Define social media marketing goal setting for successful online campaigns.  
 CO2: Analyze the effective social media marketing strategies for various types of industries and businesses.  
 CO3: Design social media content and create strategies to optimize the content's reach to the target audience.  
 CO4: Appraise the reach and track progress in achieving social media objectives with a variety of measurement tools and metrics.  
 CO5: Design a suitable social media campaign for the business goals.

**Subject and code: Rural Marketing (OEC)**

**Course Code: G 401 OE 2.3**

**Course Outcomes:**

CO1: Describe the importance and application of various concepts of rural marketing.  
 CO2: demonstrate the appropriate selection of the segmentation, targeting and positioning strategies along with the environmental factors that influence rural consumers' buying behavior.  
 CO3: Design a Pricing Strategy that suits the characteristics of rural products and the stage

in the product life cycle.

CO4: Formulate the appropriate marketing communication and rural distribution channel plans to promote and deliver the rural products.

CO5: Appraise the recent trends in Rural marketing and the application of digital technology in rural marketing.

**Subject and code: MONEY AND PUBLIC FINANCE –OPEN ELECTIVE**

**Course Code: G401 OE 3.3**

**Course Outcomes:**

CO1: Understand the meaning of public finance or government finance; its nature, subject matter, explain the differences between public finance and private finance and differentiate between the public and private goods

CO2: Classify the public revenue and its various sources; revenue receipts and non-revenue receipts, understand the tax and no-tax revenues, the causes of increasing public expenditure in the modern economies

CO3: Explain the varying effects of public expenditure on the economy and role of public expenditure in a developing economy

CO4: Understand the various sources of government borrowing and the reasons behind the growing public debt, describe how the debt is repaid, the role of public debt in developing countries.

#### **Semester- IV**

**Subject and code: MANAGEMENT ACCOUNTING**

**Course Code: G 401 DC 1.4**

**Course Outcomes:**

CO1: Able to understand the concept of Management Accounting.

CO2: To Understand and recall ratios and apply the same on given case.

CO3: To construct cash flow statement.

CO4: Should be able to apply Marginal cost ratios to make business decisions.

CO5: Student should be able to analyze business problems through applications.

**Subject and code: Business Analytics**

<b>Course Code: G 401 DC 2.4</b>
<b>Course Outcomes:</b>
CO1: Able to understand Data Types and storage of Data. CO2: To understand types of analytics and data models. CO3: To demonstrate visualization of data. CO4: To recall the data mining and processing of data. CO5: Able to understand concepts of different analytics model.
<b>Subject and code: Financial Markets &amp; Services</b>
<b>Course Code: G 401 DC 3.4</b>
<b>Course Outcomes:</b>
CO1:To able to recall concepts of financial system. CO2:Able to differentiate the roles of financial institutions. CO3: Able understand concept of financial services. CO4: To understand the trading process of Instruments. CO5: Able to Summarize the concept of stock market.
<b>Subject and code: FINANCIAL MANAGEMENT</b>
<b>Course Code: G 401 DC 4.4</b>
<b>Course Outcomes:</b>
CO1: To identify the goals of financial management. CO2: To appraise the concepts of time value of money. CO3: To understand the different models of dividend policy. CO4: Able to analyze the business problem related to investments. CO5: Able to appraise the working capital requirements in an organization.
<b>Semester- V</b>
<b>Subject and code: COST ACCOUNTING</b>
<b>Course Outcomes:</b>
CO1: To familiarize students with various cost accounting concepts, objectives, process, elements of cost and cost audit.
<b>Subject and code: ADVANCED MANAGEMENT ACCOUNTING (CIMA)</b>

<b>Course Outcomes:</b>
CO1: Focusing primarily on the long term, advanced management accounting builds on the insights about costs and their drivers.
CO2: To provide the competencies needed to analyse plan and manage costs to support the implementation of the organisation's strategy.
CO3: To show how to manage and control the performance of various MODULE s of the organisation in line with both short-term budgets and long-term strategy.
<b>Subject and code:    OPERATIONS MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1: Students will understand the basics of Operations Management.
CO2: The study will make students to realise the various areas of applicability of Operations Management
<b>Subject and code:    ADVANCED TAXATION- I</b>
<b>Course Outcomes:</b>
CO1: To acquaint students with knowledge about Direct Tax laws pertaining to various assesses with latest amendments
<b>Subject and code:    AUDITING</b>
<b>Course Outcomes:</b>
CO1: To familiarise the students with the scope, objectives, procedures and techniques of audit.
<b>Semester- VI</b>
<b>Subject and code:    COST AND MANAGEMENT ACCOUNTING</b>
<b>Course Outcomes:</b>
CO1: To familiarize the students on the use of cost accounting methods and techniques in different nature of businesses and its application for managerial decision making.

<b>Subject and code: FINANCIAL STRATEGY (CIMA)</b>
<b>Course Outcomes:</b>
CO1: Financial Strategy focuses on the formulation and implementation of financial strategy to support the overall strategy of the organisation. Using insights gained from Financial Reporting and Taxation and Advanced Financial Reporting, it provides the competencies to evaluate the financing requirements of organisations and the relative merits of alternative sources of finance to meet these requirements.
<b>Subject and code: INVESTMENT MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1: To acquaint the students regarding the fundamentals of investment and to assess the investment opportunities available in the Indian market.
<b>Subject and code: ADVANCED TAXATION- II</b>
<b>Course Outcomes:</b>
CO1: To acquaint student's with basic knowledge on Goods and Services taxes and customs law in India.
<b>Subject and code: LOGISTICS AND SUPPLY CHAIN MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1: Students will explore the key issues associated with the design and management of supply chain and logistics functions.
<b>Subject and code: ENTREPRENEURSHIP DEVELOPMENT</b>
<b>Course Outcomes:</b>
CO1: To inculcate an understanding of the concept of entrepreneurship and to give a direction for the budding entrepreneurs to start up their own .
<b>Subject and code : ADVANCED FINANCIAL MANAGEMENT –II</b> <b>FINANCIAL STATEMENT ANALYSIS</b>
<b>Course Outcomes:</b>
CO1: To acquaint the students with tools, techniques and importance of financial

statements in managerial decision making.
<b>Subject and code : INDUSTRIAL RELATIONS AND LABOUR WELFARE</b>
<b>Course Outcomes:</b>
CO1: To understand the concept of industrial relations and provide a frame work for analysis of the industrial problems. CO2: It also helps to familiarise students with the mechanism adapted by many industries to settle the problems through the machinery provided by the legislation.
<b>Subject and code: ADVERTISING MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1: To give an insight to the students about the field of advertising practices that is commonly followed to make marketing effective through advertisement.
<b>Subject and code: STRATEGIC MANAGEMENT (CIMA)</b>
<b>Course Outcomes:</b>
CO1:It aims at implementing the strategies by aligning their structures, people, process, projects and relationships.  CO2: It aims to develop skills and abilities of the strategic leaders of organizations, enabling them to create the vision and direction for the growth and long term sustainable success of the organization.  CO3: It focuses on successfully managing and leading change within the process of strategy formulation and implementation

<b>Department Name:</b>	<b>G 500P A</b> <b>B. Sc. PHYSICS</b>
<b>PROGRAMME OUTCOMES</b>	
PO-1: Discipline Knowledge: Knowledge of science and ability to apply to relevant areas. PO-2: Problem solving: Execute a solution process using first principles of science to solve problems related to respective discipline. PO-3: Modern tool usage: Use a modern scientific, engineering and IT tool or technique for solving problems in the areas of their discipline.	

PO-4: Ethics: Apply the professional ethics and norms in respective discipline.
PO-5: Individual and teamwork: Work effectively as an individual as a team member in a multidisciplinary team.
PO-6: Communication: Communicate effectively with the stake holders, and give and receive clear instructions
<b>PROGRAMME SPECIFIC OUTCOMES</b>
PSO 1 : Understand and apply the principles and concepts in various disciplines of Physics. PSO 2: Develop the ability in Physics to solve analytical problems, think methodically, independently to draw logical conclusions.
<b>Semester- I</b>
<b>Subject and code : Mechanics and Properties of Matter</b> Course Code: <b>G 501 DC1.1</b>
<b>Course Outcomes:</b>
CO1: will learn to deduce the dimensions of a physical quantity, will learn about accuracy of measurement and sources of errors, importance of significant figures. CO2: will perceive the nuances of motion in one dimension and the ideas connected with it and understand the invariance of physical laws under translations. CO3. understand the basic concepts of elasticity, gain the knowledge about the properties of materials CO4. study the motion of viscous fluids CO5. effectively use measuring instruments to quantify observable phenomena CO6. understand the principles and methods used in analyzing motion of particle, verify conservation laws and gain knowledge about the rigid body mechanics. CO7. grasp the ideas of classical theory of relativity, special theory
<b>Subject and code: Practical-Lab</b> Course Code: G 501 DC2.1P
<b>Course Outcomes:</b>
CO1: will learn to deduce the dimensions of a physical quantity, will learn about accuracy of measurement and sources of errors, importance of significant figures. CO2: will perceive the nuances of motion in one dimension and the ideas connected with it

and understand the invariance of physical laws under translations.

CO3. understand the basic concepts of elasticity, gain the knowledge about the properties of materials

**Subject and code: Electrical Circuits and Wiring**

**Course Code: G 501 OE1.1**

**Course Outcomes:**

CO - 1: Will learn the various terms needed to understand the basics of current electricity.

CO - 2: Will acquire sufficient working knowledge to identify and appreciate the merit of various passive circuit elements.

CO - 3: Will get a foothold on the need and applications of electrical circuits.

CO - 4: Will graduate into understanding different sources of EMF and working of motors.

CO - 5: Will acquire skills in electrical protection systems.

CO-6: Will gain an understanding of electrical cables used in both domestic and industrial situations.

CO-7: Will learn to calculate the electrical energy consumed by various appliances

## **Semester- II**

**Subject and code: Electricity and Magnetism**

**Course Code: G 501 DC1.2**

**Course Outcomes:**

CO-1: Will learn the requires mathematical skills to understand concepts of electricity, magnetism and electromagnetism.

CO-2: Will gain the needed knowledge of the fundamental laws of electrostatics and their application in electrostatics

CO-3: Will acquire the ability to differentiate between the effect of steady and variable currents in electrical circuits.

CO-4: Will understand the intimate connection between electricity and magnetism x x x x

CO-5: Using the ideas obtained from variable currents will comprehend the concepts of converting other forms of energy into electrical energy

CO-6: Will realise that light waves are electromagnetic waves

**Subject and code: Practical-Lab**

<b>Course Code: G 501 DC2.2P</b>
<b>Course Outcomes:</b>
<p>CO-1: Will learn the requires mathematical skills to understand concepts of electricity, magnetism and electromagnetism.</p> <p>CO-2: Will gain the needed knowledge of the fundamental laws of electrostatics and their application in electrostatics</p> <p>CO-3: Will acquire the ability to differentiate between the effect of steady and variable currents in electrical circuits.</p>
<b>Subject and code Renewable Energy and Energy Harvesting Course Code: G 501 OE1.2</b>
<b>Course Outcomes:</b>
<p>CO - 1: Will be able to learn about different energy sources and know the difference between renewable and non- renewable sources of energy.</p> <p>CO - 2: Will know the significance of solar energy and of different techniques to harness solar energy.</p> <p>CO - 3: Will gain an idea about formation of waves and standing wave patterns and analysis of longitudinal and transverse waves.</p> <p>CO - 4: Will acquire knowledge of wind energy and methods to tap energy from the blowing wind to generate electrical power.</p> <p>CO - 5: Will gain familiarity about conventional energy sources and their impact on climate.</p>
<b>Semester- III</b>
<b>Subject and code: Waves and Optics</b>
<b>Course Code: G 501 DC1.3</b>
<b>Course Outcomes:</b>
<p>CO-1: Will learn the fundamentals of oscillations, periodic motion, simple harmonic motion and wave propagation</p> <p>CO-2: will perceive the nuances of wave energy and its implications x x x</p> <p>CO-3. Will understand the basic concepts of stationary waves and will be enabled to relate it to music.</p> <p>CO-4. Will study the fundamentals of optical phenomena: namely interference, diffraction</p>

and polarization.

CO-5. Will learn to setup experiments related to wave optics.

CO-6. Will understand the principles and methods used in analyzing interference fringes.

CO-7. Will be able to understand the concept of diffraction and use it to make precise measurements.

**Subject and code: Practical-Lab**

**Course Code: G 501 DC2.3P**

**Course Outcomes:**

CO-1: Will learn the fundamentals of oscillations, periodic motion, simple harmonic motion and wave propagation

CO-2: will perceive the nuances of wave energy and its implications x x x

CO-3. Will understand the basic concepts of stationary waves and will be enabled to relate it to music.

CO-4. Will study the fundamentals of optical phenomena: namely interference, diffraction and polarization.

**Subject and code: Fundamentals of Optics and Electricity**

**Course Code: G 501 OE1.3**

**Course Outcomes:**

CO-1: Will learn the fundamentals of oscillations, periodic motion, simple harmonic motion and wave propagation

CO-2: will perceive the nuances of wave energy and its implications x x x

CO-3. Will understand the basic concepts of stationary waves and will be enabled to relate it to music.

CO-4. Will study the fundamentals of optical phenomena: namely interference, diffraction and polarization.

#### **Semester- IV**

**Subject and code: Thermal Physics and Electronics**

**Course Code: G 501 DC1.4**

**Course Outcomes:**

CO-1: Will learn the mathematical skills to understand concepts of thermal physics and

electronics.

CO-2: Will gain the needed knowledge of the fundamental laws of thermal physics and their application

CO-3: Will acquire the ability to differentiate between the effect of steady and variable currents in electrical circuits.

CO-4: Will understand the intricacies of thermal physics and electronics.

CO-5: Using the ideas obtained from variable currents will comprehend the concepts of converting other forms of energy into electrical energy

CO-6: Will understand the scope of heat and thermodynamics in further academic pursuits and also factor in the need of a functional as well as advanced knowledge of electronics.

**Subject and code: Practical-Lab**

**Course Code: G 501 DC2.4P**

**Course Outcomes:**

CO-1: Will learn the mathematical skills to understand concepts of thermal physics and electronics.

CO-2: Will gain the needed knowledge of the fundamental laws of thermal physics and their application

CO-3: Will acquire the ability to differentiate between the effect of steady and variable currents in electrical circuits.

**Subject and code : FUNDAMENTALS OF ENERGY**

**STORAGE DEVICES AND INVERTERS**

**Course Code: G 501 OE1.4**

**Course Outcomes:**

CO-1. Learn about the fundamental principles of electricity and capacitors.

CO-2. Gain working knowledge on inverters in the field of energy storage.

CO-3. Acquire the basic knowledge of principles of energy storage devices.

CO-4. Gain a working knowledge on the scale of domestic energy consumption.

**Semester- V**

**Subject and code : G501.5a : ATOMIC PHYSICS**

**Course Outcomes:**

CO-1. Understand the principles of Atomic Physics, Solid State Physics, Nuclear Physics and Analogue Electronics, Communication and Digital Electronics and Special properties of materials
<b>Subject and code : G501.5b SOLID STATE PHYSICS</b>
<b>Course Outcomes:</b>
CO-1. Understand the principles of Atomic Physics, Solid State Physics, Nuclear Physics and Analogue Electronics, Communication and Digital Electronics and Special properties of materials
<b>Subject and code : G 501.5P : PRACTICAL – V:</b>
<b>Course Outcomes:</b>
CO-1. Understand the principles of Atomic Physics, Solid State Physics, Nuclear Physics and Analogue Electronics, Communication and Digital Electronics and Special properties of materials
<b>Semester- VI</b>
<b>Subject and code : G501.6a NUCLEAR PHYSICS AND ANALOG ELECTRONICS</b>
<b>Course Outcomes:</b>
CO-1. Understand the principles of Atomic Physics, Solid State Physics, Nuclear Physics and Analogue Electronics, Communication and Digital Electronics and Special properties of materials
<b>SUBJECT and Code: G501.6b COMMUNICATION AND DIGITAL ELECTRONICS, SPECIAL PROPERTIES OF MATERIALS</b>
<b>Course Outcomes:</b>
CO-1. Understand the principles of Atomic Physics, Solid State Physics, Nuclear Physics and Analogue Electronics, Communication and Digital Electronics and Special properties of materials
<b>SUBJECT and Code: G 501.6P : PRACTICAL – VI</b>
<b>Course Outcomes:</b>
CO-1. Understand the principles of Atomic Physics, Solid State Physics, Nuclear Physics and Analogue Electronics, Communication and Digital Electronics and Special properties of materials

<b>Department Name:</b>	<b>G 500P A</b> <b>B. Sc. CHEMISTRY</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO. 1: Develop enthusiasm for Chemistry and its application in various fields of life.</p> <p>PO. 2: Have a broad and balanced knowledge and understanding of key concepts in Chemistry.</p> <p>PO. 3: Develop a range of practical skills to understand and assess risks and work safely measures to be followed in the laboratory.</p> <p>PO. 4: Develop the ability to apply standard methodology to the solution of problems in Chemistry.</p> <p>PO. 5: Gain knowledge and skill towards employment or higher education in Chemistry or multi-disciplinary areas involving Chemistry.</p> <p>PO. 6: Plan and carry out experiments independently and assess the significance of outcomes and to cater to the demands of chemical Industries of well-trained graduates.</p> <p>PO. 7: Adapt and apply methodology to the solution of unfamiliar types of problems.</p> <p>PO. 8: Critically aware of advances at the forefront of chemical sciences, prepare effectively for professional employment or research degrees in chemical sciences and to develop an independent and responsible work ethics.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO 1: Students will have a firm foundation in the fundamentals and applications of Chemistry and its multidisciplinary approach towards physical or biological sciences.</p> <p>PSO 2: Students through the study of Chemistry will be prepared for various opportunities in the fields of pharmaceuticals, chemical manufacturing, forensic science, food products, environmental monitoring, plastic, cosmetics &amp; agro-industries etc. in addition to oil, gas and power sectors as well as defence services.</p>	
<b>Semester- I</b>	

**Subject and code : ANALYTICAL AND ORGANIC CHEMISTRY- I****Course Code: G 502 DC1.1****Course Outcomes:**

CO 1: The concepts of chemical analysis, accuracy, precision and statistical data treatment.

CO 2: The errors in chemical analysis and methods of minimizing.

CO 3: The preparation of standard solutions and dilution of stock solution.

CO 4: The concept of volumetric and gravimetric analysis and deducing the conversion factor

for determination.

CO 5: General purification techniques and different types of chromatographic methods.

CO 6: Handling of toxic chemicals, concentrated acids and organic solvents and practice safety procedures.

CO 7: The concepts of organic reactions and techniques of writing the movement of electrons, bond breaking, bond forming and reactive intermediates involved.

CO 8: The concepts of aromaticity, resonance and hyperconjugation.

CO 9: Understand the preparation of alkanes, alkenes, dienes and their reactions.

CO 10: Understand the mechanism of nucleophilic, electrophilic reactions.

**Subject and code: ANALYTICAL AND ORGANIC CHEMISTRY  
PRACTICALS-I****Course Code: G 502 DC2.1P****Course Outcomes:**

CO 1: The concepts of chemical analysis, accuracy, precision and statistical data treatment.

CO 2: The errors in chemical analysis and methods of minimizing.

CO 3: The preparation of standard solutions and dilution of stock solution.

CO 4: The concept of volumetric and gravimetric analysis and deducing the conversion factor

for determination.

CO 5: General purification techniques and different types of chromatographic methods.

**Subject and code: CHEMISTRY IN DAILY LIFE****Course Code: G 502 OE1.1**

<b>Course Outcomes:</b>
CO1: To understand chemical reactions and strategies to balance them. the relative quantities of reactants and products. the fundamental properties of atoms, molecules, and the various states of matter.
<b>Semester- II</b>
<b>Subject and code: INORGANIC AND PHYSICAL CHEMISTRY-I G 502 DC1.2</b>
<b>Course Outcomes:</b>
CO 1: Basics of Quantum mechanics, quantum numbers and its significance CO 2: Rules governing electronic configuration of elements CO 3: Variation in properties of s and p block elements CO 4: Deviation of real gases from ideal gases. CO 5: Molecular velocities associated with gases CO 6: Properties of liquids and its determination. CO 7: Concept of refractive index and its determination CO 8: Different types of crystal systems. CO 9: The structure of liquid crystals and its applications.
<b>Subject and code: INORGANIC AND PHYSICAL CHEMISTRY PRACTICALS-I G 502 DC2.2P</b>
<b>Course Outcomes:</b>
CO 1: Basics of Quantum mechanics, quantum numbers and its significance CO 2: Rules governing electronic configuration of elements CO 3: Variation in properties of s and p block elements CO 4: Deviation of real gases from ideal gases. CO 5: Molecular velocities associated with gases CO 6: Properties of liquids and its determination. CO 7: Concept of refractive index and its determination CO 8: Different types of crystal systems. CO 9: The structure of liquid crystals and its applications.

<b>Subject and code : MOLECULES OF LIFE</b> <b>G 502 OE1.2</b>
<b>Course Outcomes:</b>
CO1: Molecular velocities associated with gases CO2: The structure of liquid crystals and its applications.
<b>Semester- III</b>
<b>Subject and code:    Course Code: G 501 DC1.3</b>
<b>Course Outcomes:</b>
CO-1: Will learn the fundamentals of oscillations, periodic motion, simple harmonic motion and wave propagation CO-2: will perceive the nuances of wave energy and its implications x x x CO-3. Will understand the basic concepts of stationary waves and will be enabled to relate it to music. CO-4. Will study the fundamentals of optical phenomena: namely interference, diffraction and polarization. CO-5. Will learn to setup experiments related to wave optics. CO-6. Will understand the principles and methods used in analyzing interference fringes. CO-7. Will be able to understand the concept of diffraction and use it to make precise measurements.
<b>Subject and code:    Practical-Lab</b> <b>Course Code: G 501 DC2.3P</b>
<b>Course Outcomes:</b>
CO-1: Will learn the fundamentals of oscillations, periodic motion, simple harmonic motion and wave propagation CO-2: will perceive the nuances of wave energy and its implications x x x CO-3. Will understand the basic concepts of stationary waves and will be enabled to relate it to music. CO-4. Will study the fundamentals of optical phenomena: namely interference, diffraction and polarization.
<b>Subject and code:    Fundamentals of Optics and Electricity</b>

<b>Course Code: G 501 OE1.3</b>
<b>Course Outcomes:</b>
<p>CO-1: Will learn the fundamentals of oscillations, periodic motion, simple harmonic motion and wave propagation</p> <p>CO-2: will perceive the nuances of wave energy and its implications x x x</p> <p>CO-3. Will understand the basic concepts of stationary waves and will be enabled to relate it to music.</p> <p>CO-4. Will study the fundamentals of optical phenomena: namely interference, diffraction and polarization.</p>
<b>Semester- IV</b>
<p><b>Subject and code: Thermal Physics and Electronics</b></p> <p><b>Course Code: G 501 DC1.4</b></p>
<b>Course Outcomes:</b>
<p>CO-1: Will learn the mathematical skills to understand concepts of thermal physics and electronics.</p> <p>CO-2: Will gain the needed knowledge of the fundamental laws of thermal physics and their application</p> <p>CO-3: Will acquire the ability to differentiate between the effect of steady and variable currents in electrical circuits.</p> <p>CO-4: Will understand the intricacies of thermal physics and electronics.</p> <p>CO-5: Using the ideas obtained from variable currents will comprehend the concepts of converting other forms of energy into electrical energy</p> <p>CO-6: Will understand the scope of heat and thermodynamics in further academic pursuits and also factor in the need of a functional as well as advanced knowledge of electronics.</p>
<p><b>Subject and code: Practical-Lab</b></p> <p><b>Course Code: G 501 DC2.4P</b></p>
<b>Course Outcomes:</b>
<p>CO-1: Will learn the mathematical skills to understand concepts of thermal physics and electronics.</p> <p>CO-2: Will gain the needed knowledge of the fundamental laws of thermal physics and</p>

their application

CO-3: Will acquire the ability to differentiate between the effect of steady and variable currents in electrical circuits.

**Subject and code : FUNDAMENTALS OF ENERGY**

**STORAGE DEVICES AND INVERTERS**

**Course Code: G 501 OE1.4**

**Course Outcomes:**

CO-1. Learn about the fundamental principles of electricity and capacitors.

CO-2. Gain working knowledge on inverters in the field of energy storage.

CO-3. Acquire the basic knowledge of principles of energy storage devices.

CO-4. Gain a working knowledge on the scale of domestic energy consumption.

**Semester- V**

**Subject and code : G 502.5a: Chemistry Paper V**

**Course Outcomes:**

CO1: Define and understand various colligative properties and to differentiate between different liquid mixtures.

CO2: Explain the basic definitions and terms in a phase diagram.

CO3: Define magnetic behavior of different metal complexes and explain geometry of the complex based on magnetic moment data.

CO4: Predict mechanism of electrophilic substitution reactions in heterocyclic compounds.

CO5: Compare the basicity of heterocyclic compound containing nitrogen.

CO6: Understand significance of metalloporphyrins and its functions in biological system.

**Subject and code : G502.5b: Chemistry Paper VI**

**Course Outcomes:**

CO1: Understand the basic concepts of quantum mechanics and to derive expression for Schrodinger wave equation.

CO2: Familiarize with the basics of rotational spectra and its application to determine bond length and moment of inertia.

CO3: Learn the basics of electronics spectroscopy and able to apply Woodward-Fieser rules for calculating absorption maximum in dienes.

CO4: Explain general characteristics of inorganic polymers of silicon, phosphorous, boranes.

CO5: Explain the structures of biomolecules (carbohydrates, proteins, enzymes, lipids and hormones) and their role in biological processes.

C06: Understand the interconversion of the carbohydrate and plan their synthesis.  
 C07: Summarize the functions of proteins and recognize the importance of the three-dimensional shape of a protein on its function.  
 C08: Explain protein denaturation and the effect of heat on protein structure and function.

**Subject and code : G 502.5P - Chemistry Practical V**

**Course Outcomes:**

CO1: Understand the basic concepts of quantum mechanics and to derive expression for Schrodinger wave equation.  
 CO2: Familiarize with the basics of rotational spectra and its application to determine bond length and moment of inertia

**Semester- VI**

**Subject and code: G502.6a: Chemistry Paper VII**

**Course Outcomes:**

CO1: Describe molecular vibrations with the interaction of matter and electromagnetic waves and identify vibrational degrees of freedom.  
 CO2: Explain the basic concepts in infrared and Raman spectroscopy.  
 CO3: Understand the principle, instrumentation and applications of mass spectroscopy.  
 CO4: Predict thermodynamic and kinetic stabilities of metal complexes and mechanism of substitution in square planar complexes.  
 CO5: Understand bonding and applications of organometallic complexes.  
 CO6: Classify basic symmetry groups and operations in simple molecules.  
 CO7: Understand the concept of enolates and active methylene compounds and their role in organic synthesis.  
 CO8: Understand description of various types of nano materials, host-guest chemistry, self-assembled structures, nano-structured materials, and their applications.  
 CO9: Design multistep organic synthesis by retrosynthetic approach.

**Subject and code: G502.6b: Chemistry Paper VIII**

**Course Outcomes:**

CO1: Understand basic principle of electrochemistry and its applications.  
 CO2: Learn different types of galvanic cells, Nernst equation, calculations of thermodynamic properties and applications of conductometric and potentiometric titrations.

C03: Learn principles and application of Green chemistry in industrial processes.
C04: Understand the importance and theory behind biopolymers and biodegradable polymers.
C05: Understand the basics of NMR spectroscopy and apply this knowledge to elucidate the structure of simple organic molecules.
C06: Learn structures of some alkaloids and terpenes and their extraction process from plants.
<b>Subject and code: G502.6P: Chemistry Practical VI</b>
<b>Course Outcomes:</b>
C01: Understand basic principle of electrochemistry and its applications.
C02: Learn different types of galvanic cells, Nernst equation, calculations of thermodynamic properties and applications of conductometric and potentiometric titrations.

<b>Department Name:</b>	<b>G 500P B</b> <b>B. Sc - MATHEMATICS</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO 1 Disciplinary Knowledge: Bachelor degree in Mathematics is the culmination of in-depth knowledge of Algebra, Calculus, Geometry, differential equations and several other branches of pure and applied mathematics. This also leads to study the related areas such as computer science and other allied subjects</p> <p>PO 2 Communication Skills: Ability to communicate various mathematical concepts effectively using examples and their geometrical visualization. The skills and knowledge gained in this program will lead to the proficiency in analytical reasoning which can be used for modeling and solving of real life problems.</p> <p>PO 3 Critical thinking and analytical reasoning: The students undergoing the programme acquire ability of critical thinking and logical reasoning and capability of recognizing and distinguishing the various aspects of real life problems.</p> <p>PO 4 Problem Solving: The Mathematical knowledge gained by the students through the programme develop an ability to analyze the problems, identify and define appropriate computing requirements for its solutions. This programme enhances students overall</p>	

development and also equip them with mathematical modelling ability, problem solving skills.

PO 5 Research related skills: Student completing the program will develop the capability of inquiring about appropriate questions relating to the Mathematical concepts in different areas of Mathematics.

PO 6 Information/digital Literacy: The completion of the programme will enable the learner to use appropriate softwares to solve system of algebraic equation and differential equations.

PO 7 Self – directed learning: Student completing the program will develop an ability of working independently and to make an in-depth study of various notions of Mathematics.

PO 8 Moral and ethical awareness/reasoning: The student completing the program will develop an ability to identify unethical behavior such as fabrication, falsification or misinterpretation of data and adopting objectives, unbiased and truthful actions in all aspects of life, in general and Mathematical studies, in particular.

PO 9 Lifelong learning: The programme provides self-directed learning and lifelong learning skills. The programme helps the learner to think independently and develop algorithms and computational skills for solving real word problems.

PO 10 Ability to peruse advanced studies and research in pure and applied Mathematical sciences.

#### **PROGRAMME SPECIFIC OUTCOMES**

##### **PSO 1**

To be familiar with suitable tools of mathematical analysis to handle issues and problems in Mathematics and related sciences.

##### **PSO 2**

Acquire sufficient knowledge and skills to undertake further studies in Mathematics and its allied areas on multiple disciplines concerned with Mathematics.

##### **PSO 3**

Develop a positive attitude towards mathematics as a technical language and valuable subject of study.

#### **Semester- I**

**Subject and code : Number Theory - I, Algebra - I and Calculus – I**  
**Course Code: G 503 DC1.1**

#### **Course Outcomes:**

CO1: Understand the elementary concepts of Number Theory.

CO2: Solve the system of homogeneous and non-homogeneous  $m$  linear equations in  $n$  variables.

CO3: Sketch curves in Cartesian and polar co-ordinates.

CO4: Identify and apply intermediate value theorem, mean value theorems and L'Hospital rule.

**Subject and code: Theory based practicals on Number Theory – I, Algebra - I and Calculus – I**

**Course Code: G 503 DC2.1P**

**Course Outcomes:**

CO1: Learn Free and Open Source Software (FOSS) tools for computer programming.

CO2: Solve problems on Algebra and Calculus studied in MATDSCT 1.1 by using FOSS softwares.

CO3: Acquire knowledge of applications of algebra and calculus through FOSS.

**Subject and code: Mathematics – I**

**Course Code: G 503 OE1.1**

**Course Outcomes:**

CO1: Understand the elementary concepts of Number Theory.

CO2: Solve the system of homogeneous and non-homogeneous  $m$  linear equations in  $n$  variables.

CO3: Identify and apply intermediate value theorem, mean value theorems and L'Hospital rule.

**Subject and code: : Business Mathematics-I**

**Course Code: G 503 OE1.1(B)**

**Course Outcomes:**

CO1 Solve the system of homogeneous and non-homogeneous  $m$  linear equations in  $n$  variables.

CO2: Integrate concepts in international business with functioning global trade.

CO3: Evaluate the legal, social and economic environment of business.

CO4: To learn different techniques of simplification of real number system

CO5: Will be able to apply knowledge of business concepts and functions in an integrated manner.

**Semester- II**

**Subject and code: Number Theory - II, Algebra - II and Calculus - II**

**Course Code: G 503 DC1.2**

**Course Outcomes:**

CO1: Understand the Euler's  $\phi$ -function and finite continued fractions.

CO2: Recognize the mathematical objects called Groups.

CO3: Identify cyclic and non-cyclic groups

CO4: Link the fundamental concepts of groups and symmetries of geometrical objects.

CO5: Understand the concept of partial derivatives of functions of several variables.

CO6: Find the Taylor's and Maclaurin's series of functions of two variables.

CO7: Find the extreme values of functions of two variables.

CO8: Understand the concepts of line integrals, multiple integrals and their applications.

**Subject and code: Theory based practicals on Number Theory – II, Algebra - II and Calculus – II**

**Course Code: G 503 DC2.2P**

**Course Outcomes:**

CO1: Learn Free and Open Source Software (FOSS) tools for computer programming.

CO2: Solve problems on Algebra and Calculus studied in MATDSCT 1.1 by using FOSS softwares.

CO3: Acquire knowledge of applications of algebra and calculus through FOSS.

**Subject and code Mathematics – II**

**Course Code: G 503 OE1.2**

**Course Outcomes:**

CO1: Recognize the mathematical objects called Groups.

CO2: Identify cyclic and non-cyclic groups

CO3: Link the fundamental concepts of groups and symmetries of geometrical objects.

CO4: Find the extreme values of functions of two variables.

CO5: Understand the concepts of line integrals, multiple integrals and their applications.

**Subject and code : Business Mathematics-II**

**Course Code: G 503 OE1.2:**

**Course Outcomes:**

CO1: Explain the concepts and use equations, formulae and mathematical expressions in a variety of context.

CO2: Find the extreme values of functions.

CO3: Analyze and demonstrate the mathematical skill required in mathematically intensive areas such as economics, business etc.

**Semester- III**

**Subject and code: Ordinary Differential Equations and Real Analysis–I**  
**Course Code: G 503 DC1.3**

**Course Outcomes:**

CO1: Understand the concept of differential equation.

CO2: Classifies the differential equations with respect to their order and linearity.

CO3: Demonstrate skills in constructing rigorous mathematical arguments.

CO4: Demonstrate skills in communicating mathematics.

CO5: Understand and be able to apply basic definitions and concepts of convergence.

CO6: To prove simple statements involving convergent arguments.

CO7: Learn to solve differential equation using Scilab/Maxima

**Subject and code: Theory based practicals on Ordinary**

**Differential Equations and Real Analysis – I**

**Course Code: G 503 DC2.3P**

**Course Outcomes:**

CO1: Understand the concept of differential equation.

CO2: Classifies the differential equations with respect to their order and linearity.

CO3: Demonstrate skills in constructing rigorous mathematical arguments.

**Subject and code: (A) Ordinary Differential Equations**

**Course Code: G 503 OE1.3**

<b>Course Outcomes:</b>
CO1: Understand the concept of differential equation. CO2: Classifies the differential equations with respect to their order and linearity. CO3: Demonstrate skills in constructing rigorous mathematical arguments. CO4: Demonstrate skills in communicating mathematics.
<b>Subject and code: (B) Quantitative Mathematics</b> Open Elective (For Students of other than Science Stream) <b>Course Code: G 503 OE1.3</b>
<b>Course Outcomes:</b>
CO1: To enable student to answer competitive examinations CO2: Solve Speed and Distance related problems. CO3: Solve Present & Past age calculations.
<b>Semester- IV</b>
<b>Subject and code: Partial Differential Equations and Integral Transforms</b> <b>Course Code: G 503 DC1.4</b>
<b>Course Outcomes:</b>
CO1: Understand the concept of Partial differential equation. CO2: Classifies the Partial differential equations with respect to their order and linearity. CO3: Understand and be able to apply various methods to solve Partial Differential Equations. CO4: Learn to solve Integral Equations and differential equations using Laplace Transforms.
<b>Subject and code: Theory based practicals on Partial Differential Equations and Integral Transforms</b> <b>Course Code: G 503 DC2.4P</b>
<b>Course Outcomes:</b>
CO1: Understand the concept of Partial differential equation. CO2: Classifies the Partial differential equations with respect to their order and linearity. CO3: Understand and be able to apply various methods to solve Partial Differential

Equations.

CO4: Learn to solve Integral Equations and differential equations using Laplace Transforms.

**Subject and code : (A) Partial Differential Equations**

**Course Code: G 503 OE1.4**

**Course Outcomes:**

CO1: Understand the concept of Partial differential equation.

CO2: Classifies the Partial differential equations with respect to their order and linearity.

CO3: Understand and be able to apply various methods to solve Partial Differential Equations.

**Subject and code: (B) Mathematical Finance**

**Course Code: G 503 OE1.4:**

**Course Outcomes:**

CO1: develop problem solving skills with a particular emphasis on financial and business applications

CO2: Find solution to the problems related percentage, true discount and profit and loss.

CO3: Employ methods related to these concepts in a variety of financial applications.

**Semester- V**

**Subject and code: DIFFERENTIAL EQUATIONS, LAPLACE TRANSFORM AND ALGEBRA**

**G 503.5(a)**

**Course Outcomes:**

CO -1 Solve the homogeneous linear differential equations with constant coefficients.

CO -2 Use the method “variations of parameters” to find to solution of higher-order linear differential equations with variable coefficients.

CO -3 Relate the concepts of groups and rings.

CO -4 Verify if a given set is a commutative ring or field or integral domain.

CO -5 Explain basic properties of Laplace transform.

CO -6 Find Laplace transform of a function using gamma function and step function.

CO -7 Will be able to use the Laplace transform in finding the solution of linear differential equations.

<b>Semester- VI</b>
<b>Subject and code: PARTIAL DIFFERENTIAL EQUATIONS, FOURIER SERIES AND LINEAR ALGEBRA</b> <b>G 503.6(a)</b>
<b>Course Outcomes:</b>
CO -1 apply different methods to solve the equation of the form $Pdx + Qdy + Rdz = 0$ . CO -2 explain basic properties of Fourier transform. CO -3 recognize the concepts of the terms span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces. CO4: use matrix algebra and the related matrices to linear transformations. CO -5 to learn Inner Product spaces and Gram-Schmidt process of orthogonalization. CO -6 find Eigen values and Eigen vectors of a matrix which is used in the study of various other concepts.
<b>Subject and code: DISCRETE MATHEMATICS</b> <b>G 503.6(b)i</b>
<b>Course Outcomes:</b>
CO -1 Verify whether an algorithm works well and perform analysis in terms of memory and time. CO -2 Formulate and model problems with the concepts and techniques of discrete mathematics. CO -3 Understand the role of set theory in various concepts of discrete mathematics and connect it to various other disciplines. CO -4 Apply techniques for constructing mathematical proofs, illustrated by examples in discrete mathematics. CO -5 Develop an understanding of how graph and tree concepts are used to solve problems arising in the computer science. CO -6 Understand the importance of difference equations and efficiently solve them.
<b>Subject and code: NUMERICAL METHODS</b> <b>G 503.6(b)ii</b>
<b>Course Outcomes:</b>
CO -1 Perform an error analysis for some method. CO -2 Approximate a function using an appropriate numerical method. CO -3 Solve a linear system of equations using an appropriate numerical method. CO -4 Derive appropriate numerical methods to solve interpolation based problems. CO -5 Calculate a definite integral using an appropriate numerical method. CO -6 Evaluate a derivative at a value using an appropriate numerical method.
<b>Subject and code: GRAPH THEORY</b>

**G 503.6(b)iii****Course Outcomes:**

- CO -1 Understand the language of graphs and trees.
- CO -2 Understand various types of trees and methods for traversing trees.
- CO -3 Solve problems using basic graph theory.
- CO -4 Solve problems involving vertex and edge connectivity, planarity and crossing numbers.
- CO -5 Model real world problems using graph theory.
- CO -6 To improve the proof writing skills.

**Subject and code: LINEAR PROGRAMMING****G 503.6(a)iv****Course Outcomes:**

- CO -1 Explain basic concepts of optimization, modeling and linear modeling.
- CO -2 Distinguish the feasible solution, optimal solution and basic feasible solution.
- CO -3 Solve two variable linear programming problems with graphical method.
- CO -4 Explain the theory of simplex algorithm and approach.
- CO -5 5 apply linear programming concepts to solve problems like transportation problems and assignment problem.
- CO -6 Model a problem as a linear programming problem and apply appropriate method to obtain optimal solutions.

**Subject and code: MATHEMATICAL MODELING****G 503.6(a)v****Course Outcomes:**

- CO -1 Recognize the connections between Mathematics and other disciplines, how mathematical ideas are used in it.
- CO -2 Master principles and formulation, analysis of mathematical model system.
- CO -3 Model real world problems mathematically and analyse those models.
- CO -4 Able to identify linear programming assumptions and constraints.
- CO -5 Mention and discuss some applications of Mathematical modeling in various other fields.

**Subject and code: Distribution Theory****G 503.6(a)vi****Course Outcomes:**

- CO -1 Define expectation, and be introduced to its important linearity property.
- CO -2 Understand the properties of probability density functions and cumulative distribution functions.
- CO -3 Apply selected probability distributions to solve problems.

CO -4 Develop problem-solving techniques needed to accurately calculate probabilities.  
 CO -5 Acquire knowledge about some probability inequalities, law of large numbers, Central Limit Theorem etc.  
 CO -6 Use Central Limit Theorem to solve a few real world based problems.

<b>Department Name:</b>	<b>G 500P F</b> <b>B. Sc - COMPUTER SCIENCE</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO1. Discipline knowledge: Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity</p> <p>PO2. Problem Solving: Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.</p> <p>PO3. Design and Development of Solutions: Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems.</p> <p>PO4. Programming a computer: Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with thorough knowledge on programming languages of various levels.</p> <p>PO5: Application Systems Knowledge: Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.</p> <p>PO6. Modern Tool Usage: Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.</p> <p>PO7. Communication: Must have a reasonably good communication knowledge both in oral and writing.</p> <p>PO8. Project Management: Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.</p> <p>PO9. Ethics on Profession, Environment and Society: Exhibiting professional ethics to maintain the integrity in a working environment and also have concern on societal impacts due to computer-based solutions for problems.</p> <p>PO10. Lifelong Learning: Should become an independent learner. So, learn to learn ability.</p>	

PO11. Motivation to take up Higher Studies: Inspiration to continue educations towards advanced studies on Computer Science.

**PROGRAMME SPECIFIC OUTCOMES**

PSO1. The primary objective of this program is to provide a foundation of computing principles and business practices for effectively using/managing information systems and enterprise software

PSO2. It helps students analyze the requirements for system development and exposes students to business software and information systems

PSO3. This course provides students with options to specialize in legacy application software, system software or mobile applications

PSO4. To produce outstanding IT professionals who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves

PSO5. To provide opportunity for the study of modern methods of information processing and its applications.

PSO6. To develop among students the programming techniques and the problem- solving skills through programming

PSO7. To prepare students who wish to go on to further studies in computer science and related subjects.

PSO8. To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications.

**Semester- I**

**Subject and code : Computer Fundamentals and Programming in C**  
Course Code: **G505DC1.1**

**Course Outcomes:**

CO1: Operate desktop computers to carry out computational tasks

CO2: Understand working of hardware and software and the importance of operating systems

CO3: Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts

CO4: Read, understand and trace the execution of programs written in C language

CO5: Write the C code for a given problem

CO6: Perform input and output operations using programs in C

CO7: Write programs that perform operations on arrays

**Subject and code: C Programming Lab**

**Course Code: G505DC1.1P**

**Course Outcomes:**

CO1: Write the C code for a given problem

CO2: Perform input and output operations using programs in C

CO3: Write programs that perform operations on arrays

**Subject and code: Office Automation**

**Course Code: G505OE1.1**

**Course Outcomes:**

CO1: Compare and contrast various types of operating systems

CO2: Explain the purpose of office automation

CO3: Describe how information is stored and retrieved in/from computer memory

CO4: Know about various types of office automation software and their applications

CO5: Create document using word processing software

CO6: Design presentation using presentation software

CO7: Create worksheets using spreadsheet software

CO8: Store and retrieve data in/from database management application

## **Semester- II**

**Subject and code: Data Structures using C**

**Course Code: G505DC2.2**

**Course Outcomes:**

CO1: Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms

CO2: Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs

CO3: Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs

CO4: Demonstrate different methods for traversing trees

CO5: Compare alternative implementations of data structures with respect to performance

CO6: Describe the concept of recursion, give examples of its use
CO7: Discuss the computational efficiency of the principal algorithms for sorting and searching
<b>Subject and code: Data Structures Lab</b>
<b>Course Code: G505DC2.2P</b>
<b>Course Outcomes:</b>
CO1: Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
CO2: Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs
CO3: Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
CO4: Demonstrate different methods for traversing trees
<b>Subject and code : Web Designing</b>
<b>Course Code: G505OE2.2</b>
<b>Course Outcomes:</b>
CO1: Understand various Internet related terminologies
CO1: Explain features and evolution of Internet
CO3: Explain the use of search engines
CO4: Know the use of different tags available in HTML
CO5: Design web pages using HTML5, CSS3, XML and XHTML
CO6: Implement websites using linked web pages.
<b>Semester- III</b>
<b>Subject and code: Object Oriented Programming Concepts and Programming in JAVA</b>
<b>Course Code: G505 DC3.3</b>
<b>Course Outcomes:</b>
CO1: Understand the concepts of OOP and Java fundamentals.
CO2: Write the Java programs using the concepts of inheritance, interfaces, packages,

multithreading and applets.
<b>Subject and code: JAVA lab</b>
<b>Course Code: G505DC3.3P</b>
<b>Course Outcomes:</b>
CO1: Understand the concepts of OOP and Java fundamentals.
CO2: Write the Java programs using the concepts of inheritance, interfaces, packages, multithreading and applets.
<b>Subject and code: :IoT</b>
<b>Course Code: G505OE3.3</b>
<b>Course Outcomes:</b>
CO1: To become familiar with the basic concepts of IoT.
CO2: To become familiar with IoT access techniques.
<b>Semester- IV</b>
<b>Subject and code: Data Base Management System</b>
<b>Course Code: G505DC4.4</b>
<b>Course Outcomes:</b>
CO1: To become familiar with the basic issues of transaction processing and concurrency control
CO2:To become familiar with database storage structures and access techniques
<b>Subject and code: DBMS lab</b>
<b>Course Code: G505DC4.4P</b>
<b>Course Outcomes:</b>
CO1: To become familiar with the basic issues of transaction processing and concurrency control
CO2:To become familiar with database storage structures and access techniques
<b>Semester- V</b>
<b>Subject and code: OPERATING SYSTEM AND LINUX</b>

<b>Course Code: : G 505.5A1</b>
<b>Course Outcomes:</b>
CO1: At the end of the course students will able to Analyze the structure of OS and basic architectural components involved in design Analyze the various resource management techniques conceptualize the components involved in designing a contemporary OS. CO2: Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security.
<b>Subject and code: SHELL PROGRAMMING USING LINUX</b>
<b>Course Code: G 505.5AP</b>
<b>Course Outcomes:</b>
CO1: Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security. CO2: Develop shell scripts to perform more complex tasks.
<b>Subject and code: PRINCIPLES OF TCP/IP</b>
<b>Course Code: G 505.5A2</b>
<b>Course Outcomes:</b>
CO-1. Identifies protocols and standards in the Internet. CO-2. Describe the TCP/IP protocol suite. CO-3. Defining subnetting and supernetting. CO-4. Explain error reporting and query mechanism in the Internet. CO-5. Describe process-to-process communication (UDP, TCP, and SCTP).
<b>Subject and code: TCP/IP LAB</b>
<b>Course Code: : G 505.5AP</b>
<b>Course Outcomes:</b>
CO-1. Identifies protocols and standards in the Internet. CO-2. Describe the TCP/IP protocol suite. CO-3. Defining subnetting and supernetting. CO-4. Explain error reporting and query mechanism in the Internet.

CO-5. Describe process-to-process communication (UDP, TCP, and SCTP).
<b>Subject and code: PYTHON PROGRAMMING</b>
<b>Course Code: G505.5B1</b>
<b>Course Outcomes:</b>
CO-1. Examine python syntax & semantics and be fluent in using flow Control functions. CO-2. Demonstrate proficiency in handling strings and file systems in Python. CO-3. Create & run python programs using core data structures like Lists, dictionaries, tuples, and sets and use of REs. CO-4. Interpret and apply the concepts of OOP. CO-5. Programming and web services. CO-6. Implement exemplary applications related to network CO-7. Implement database applications in python.
<b>Subject and code: PYTHON PROGRAMMING LAB</b>
<b>G 505.5BP:</b>
<b>Course Outcomes:</b>
CO-1. Examine python syntax & semantics and be fluent in using flow Control functions. CO-2. Demonstrate proficiency in handling strings and file systems in Python. CO-3. Create & run python programs using core data structures like Lists, dictionaries, tuples, and sets and use of REs. CO-4. Interpret and apply the concepts of OOP. CO-5. Programming and web services. CO-6. Implement exemplary applications related to network CO-7. Implement database applications in python.
<b>Subject and code: - JAVA 2 ENTERPRISE EDITION (ELECTIVE)</b>
<b>Course Code: G505.5B2</b>
<b>Course Outcomes:</b>
CO-1. After the completion of this course, the students will be able to develop a small project independently
<b>Subject and code: - JAVA 2 ENTERPRISE EDITION (ELECTIVE)</b>
<b>G505.5 BP:</b>

<b>Course Outcomes:</b>
CO1: Practical knowledge of working with programming language by using j2EE concepts.
CO2: Ability to work with dynamic databases.
CO3: Create web application using java servlets and manage web session using servlets and jsp.
<b>Semester- VI</b>
<b>Subject and code: - DATA ANALYTICS</b>
<b>G505.6A1</b>
<b>Course Outcomes:</b>
CO-1. Ability to identify the characteristics of datasets and compare the trivial data and big data for various applications.
CO-2. Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration.
CO-3. Ability to solve problems associated with batch learning and online learning, and the big data characteristics such as high dimensionality, dynamically growing data and in particular scalability issues.
CO-4. Ability to understand and apply scaling up machine learning techniques and associated computing techniques and technologies.
CO-5. Ability to visualize data through various forms.
<b>Subject and code: DATA ANALYTICS LAB ( R PROGRAMMING LAB):</b>
<b>G505.6AP</b>
<b>Course Outcomes:</b>
CO-1. Understand the key issues in big data management and its associated applications in intelligent business and scientific computing.
CO-2. Acquire fundamental enabling techniques and scalable algorithms
CO-3. Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.
CO-4. Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc.
<b>Subject and code: SOFTWARE ENGINEERING AND TESTING</b>
<b>G505.6 A2</b>
<b>Course Outcomes:</b>
CO-1. Assess professional and ethical responsibility, software engineering principles and

<p>activities involved in building large software programs.</p> <p>CO-2. Demonstrate process of requirements gathering, classification, Specification &amp; validation.</p> <p>CO-3. Design models for software system, component and process Within realistic constraints.</p> <p>CO-4. Apply cost estimation and time scheduling for quality project Activities.</p> <p>CO-5. Apply, design, implement, verify, validate and maintain software Systems with metrics.</p>
<p><b>Subject and code: SOFTWARE ENGINEERING AND TESTING</b></p> <p><b>G505.6AP:</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO-1. Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.</p> <p>CO-2. Convert the requirements model into the design model and demonstrate use of software and user interface design principles</p> <p>CO-3. Justify role of SDLC in Software Project Development and they can evaluate importance of Software Engineering.</p>
<p><b>Subject and code: – Web Programming Using PHP</b></p> <p><b>G505.6B1</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO-1. Describe fundamentals of web</p> <p>CO-2. Introduce the creation of static webpage using HTML</p> <p>CO-3. Describe the importance of CSS in web development</p> <p>CO-4. Describe the function of JavaScript as a dynamic webpage creating tool</p> <p>CO-5. Distinguish PHP as a server side programming language</p>
<p><b>Subject and code: – Web Programming Using PHP Lab</b></p> <p><b>G505.6BP:</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO-1. Describe fundamentals of web</p> <p>CO-2. Introduce the creation of static webpage using HTML</p> <p>CO-3. Describe the importance of CSS in web development</p> <p>CO-4. Describe the function of JavaScript as a dynamic webpage creating tool</p>

CO-5. Distinguish PHP as a server side programming language
<b>Subject and code: G505.6 B2 - COMPUTER NETWORKS</b>
<b>Course Outcomes:</b>
CO-1. Demonstrate the principles of application layer protocols.
CO-2. Distinguish transport layer services and protocols.
CO-3. Classify IP and Routing Algorithms in network layer.
CO-4. Demonstrate streaming and working of communication networks.
CO-5. Knowledge on different transmission modes,switching and multiplexing concepts.
<b>Subject and code : COMPUTER NETWORKS LAB</b>
<b>G 505.6BP</b>
<b>Course Outcomes:</b>
CO-1. Demonstrate the principles of application layer protocols.
CO-2. Distinguish transport layer services and protocols.
CO-3. Classify IP and Routing Algorithms in network layer.
CO-4. Demonstrate streaming and working of communication networks.
CO-5. Knowledge on different transmission modes,switching and multiplexing concepts.

<b>Department Name:</b>	<b>G 500P H</b> <b>B. Sc - STATISTICS</b>
<b>PROGRAMME OUTCOMES</b>	
PO-1. Develop and demonstrate an ability to understand major concepts in various disciplines of Statistics.	
PO-2. Solve analytical problems independently and draw logical conclusions.	
PO-3. Analyse, interpret the data and hence help policy makers to take a proper decision.	
PO-4. Have a knowledge regarding use of data analytics tools like Excel, SPSS, R programming and Python.	
PO-5. Use modern statistical techniques and statistical Software to understand the concepts of Statistics.	
PO-6. Think, acquire knowledge and skills through logical reasoning and inculcate the	

culture of self-learning.

PO-7. Create an awareness about the impact of Statistics in real life and development outside the scientific community.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO 1: Understand and apply the principles of least squares to fit a model to the given data, study the association between the variables, applications of Probability Theory and Probability Distributions.

PSO 2: Understand the concept of Sampling Distributions, study the applications of various probability inequalities and Central limit theorem. Apply the statistical inference to real life situations.

PSO 3: Understand the principles and applications of Total Quality Management, Designs of Experiment, Sampling theory, Regression Model, Simulation and Operation Research.  
PSO 4: Understand the applications of various Statistical Techniques, use of Statistical tools through Excel

#### **Semester- I**

#### **Subject and code : Descriptive Statistics**

Course Code: **G 506 DC1.1**

#### **Course Outcomes:**

CO-1. Understand the principle of least squares, fitting of various types of curves and the concept of correlation and its applications.

CO-2. Explain the theory behind Regression analysis and its applications.

CO-3. Have complete knowledge of demand analysis with the law of demand and supply, Engel's curves and Pareto's law of income distribution.

CO-4: Understand probability density function, mean and variance of a random variable and the theorems of probabilities with their applications.

#### **Subject and code: Descriptive Statistics Practical**

Course Code: **G 506 DC2.1 P**

#### **Course Outcomes:**

CO-1. Analyse the data through correlation and regression analysis.

<p>Understand the applications of mathematical expectation.</p> <p>CO-2. Understand the concept of demand analysis with practical examples.</p> <p>CO-3. Find the mean and variance of the given random variable.</p>
<p><b>Subject and code: Statistical Methods</b></p> <p><b>Course Code: G 506 OE1.1</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO1. Acquire knowledge of statistical methods.</p> <p>CO2. Identify types of data and visualization, analysis and interpretation.</p> <p>CO3. Know about elementary probability and probability models.</p> <p>CO4. Employ suitable test procedures for the given data set.</p>
<p><b>Semester- II</b></p>
<p><b>Subject and code: Probability Distributions</b></p> <p><b>Course Code: G 506 DC1.2</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO-1. Understand the concept of mathematical expectation and its properties.</p> <p>CO-2. Have complete knowledge about standard discrete distributions and its applications.</p> <p>CO-3. Explain the various continuous probability distributions with mean, variance median, MGF and its applications.</p> <p>CO-4: Understand the theory of distribution functions of random variables using mgf and Jacobian transformation.</p>
<p><b>Subject and code: Probability Distributions Practical</b></p> <p><b>Course Code: G 506 DC2.2 P</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO-1. Understand the applications of mathematical expectation.</p> <p>CO-2. Identify, relate and differentiate probability distributions and apply them in day to day life.</p> <p>CO-3. Have the ability to fit a probability distribution to the given data.</p>
<p><b>Subject and code : Applied Statistics</b></p>

<b>Course Code: G 506 OE1.2</b>
<b>Course Outcomes:</b>
CO-1. Understand the applications of Vital events, Life table in government policies and planning.
CO-2. Apply the Statistical tools like Index Numbers and Time Series for real life situations.
<b>Semester- III</b>
<b>Subject and code: Differential Calculus and Probability Distributions</b>
<b>Course Code: G 506 DC1.3</b>
<b>Course Outcomes:</b>
CO-1. Understand the concept of mathematical expectation and its properties.
CO-2. Have complete knowledge about standard discrete distributions and its applications.
CO-3. Explain the various continuous probability distributions with mean, variance median, MGF and its applications.
CO-4: Understand the theory of distribution functions of random variables using mgf and Jacobian transformation.
<b>Subject and code: Differential Calculus and Probability Distributions</b>
<b>Practical</b>
<b>Course Code: G 506 DC2.3 P</b>
<b>Course Outcomes:</b>
CO-1. Understand the applications of mathematical expectation.
CO-2. Identify, relate and differentiate probability distributions and apply them in day to day life.
CO-3. Have the ability to fit a probability distribution to the given data.
<b>Subject and code: Biostatistics</b>
<b>Course Code: G 506 OE1.3</b>
<b>Course Outcomes:</b>
C01: To enable the students to identify the variables of biological studies and explore

the tools of classification and presentation.

CO2: To study the probability notion, models and their applications in the study of biological phenomenon.

CO3: To acquire knowledge on sampling distribution and testing of hypotheses.

#### **Semester- IV**

**Subject and code: Statistical Inference-I**

**Course Code: G 506 DC1.4**

**Course Outcomes:**

CO-1. Understand the sampling distributions like Chi-square, Student's t  
Snedecor's F distributions and the distribution of Order statistic.

CO-2. Impart knowledge about probability inequalities and convergence concepts.

CO-3. Understand the theory of point estimation, method of maximum likelihood  
estimation, method of moment and its applications.

CO-4: Explain the theory of interval estimation and its applications.

**Subject and code: Statistical Inference-I Practical**

**Course Code: G 506 DC2.4 P**

**Course Outcomes:**

CO-1. Understand the applications of probability inequalities, central theorem and  
WLLN.

CO-2. Understand the applications of methods of point estimation.

CO-3. Apply the theory of interval estimation to real life.

**Subject and code: Business Statistics**

**Course Code: G 506 OE1.4**

**Course Outcomes:**

CO1. Frame and formulate management decision problems.

CO2. Understand the basic concepts underlying quantitative analysis.

CO3. Use sound judgment in the applications of quantitative methods to management  
Decisions

<b>Semester- V</b>
<b>Subject and code: DESIGNS OF EXPERIMENTS</b>
<b>Course Code: G 506.5a:</b>
<b>Course Outcomes:</b>
<p>CO-1. Impart knowledge on applying the technique of ANOVA to design studies, perform analyses, interpret the results appropriately, and make generalizations.</p> <p>CO-2. Understanding the advantages &amp; disadvantages of various designs and also learning to apply various designs for agricultural data/agricultural fields.</p> <p>CO-3. Describe the analysis of the data from the experiment should be carried out for missing data/ missing plots in the agricultural field.</p> <p>CO-4: Familiarize with 2 2 &amp; 2 3 factorial experiments and analyze the data for agriculture data and draw meaningful conclusions.</p>
<b>Subject and code: TOTAL QUALITY MANAGEMENT (ELECTIVE-1)</b>
<b>G 506.5 b:</b>
<b>Course Outcomes:</b>
<p>CO-1. Understand the concept of Total Quality Management in the production process and tools of TQM,</p> <p>CO-2. Explain the various tools and techniques of TQM and general theory of control charts.</p> <p>CO-3. Derive the control limits of various variable and attribute control charts and interpret the same.</p> <p>CO-4: Design acceptance sampling methods for attributes and variables</p>
<b>Subject and code: DESIGN OF EXPERIMENTS &amp;: TOTAL QUALITY MANAGEMENT (ELECTIVE -1) PRACTICAL</b>
<b>Course Code: G 506.5a and G 506.5 b</b>
<b>Course Outcomes:</b>
<p>CO-1. Explain the applications of various models of designs of experiment.</p> <p>CO-2. Analyse factorial experiments for real life.</p> <p>CO-3. Understand the applications of control charts in industry and analyse the</p>

given data.

CO-4: Understand how to design a proper Acceptance Sampling Plan.

**Subject and code: – Regression Analysis Elective (2)**

**Course Code: G506.5b.**

**Course Outcomes:**

CO-1.Explain the meaning of Regression models, point and interval estimation using the regression equation, prediction and residual analysis.

CO-2. Understand Multiple regression model, estimation of parameter testing and confidence intervals and prediction.

CO-3. Build a regression model and analyse the given data.

CO-4: Understand how to use various variable selection procedure and multiple regression approach to analysis of variance and experimental design.

**Subject and code: –REGRESSION ANALYSIS (ELECTIVE-2)  
PRACTICAL**

**Course Code: G 506.6 b:**

**Course Outcomes:**

CO-1. Explain the applications of various models of designs of experiment.

CO-2. Analyse factorial experiments for real life.

CO-3. Apply the regression analysis to analyse real life data.

CO-4: Understand how to use multiple regression and variable selection procedure.

#### **Semester- VI**

**Subject and code: : SAMPLING THEORY**

**G 506.6a**

**Course Outcomes:**

CO-1. Understand the importance of sampling in analysing data and the methods of determining size of the sample.

CO-2. Understand the difference between simple random sampling with replacement and without replacement, estimation of various population parameters and precision of these estimates.

CO-3. Have complete knowledge of Stratified random sampling and its application. Also to identify the efficiency of various sampling methods with Stratified

sampling. CO-4: Understand theoretical concept of Systematic and Cluster sampling with applications in real life.
<b>Subject and code: OPERATIONS RESEARCH (ELECTIVE - 1)</b> <b>G 506.6b:</b>
<b>Course Outcomes</b>
CO-1. Understand the concept of OR, Linear programming problem various methods of solving linear programming problem and its applications in industry. CO-2. Gain knowledge about transportation problems, applying various methods to real life situations and obtaining optimum solutions. CO-3. Understand the concepts of Assignment problem and Game Theory with their applications. CO-4: Familiarize the concepts of inventory problems and apply various types of EOQ models to solve the problems of industry.
<b>Subject and code: SAMPLING THEORY &amp; G 506.6b : OPERATIONS RESEARCH (ELECTIVE - 1) PRACTICAL G 506.6 a</b>
<b>Course Outcomes</b>
CO-1. Understand how to draw a simple random sample with replacement and without replacement and find best estimates for the population. CO-2. Find out the efficiency of various methods of sampling and decide the best method for the situations under consideration. CO-3. Understand the applications of various optimal tools in industry. CO-4: Take a proper decision about the selection of one of the tools of optimization.
<b>Subject and code: Elective (2) Simulation G506.6a:</b>
<b>Course Outcomes</b>
CO-1. Understand the technique of Simulation and its areas of applications. CO-2. Explain the method of random number generation and applications of various tests for random numbers. CO-3. Understand various random variate generation methods and how to apply these methods for different continuous probability distributions. CO-4: Apply Variance Reduction technique.
<b>Subject and code: G506.6a.: Practical based on G506.6 and G506.6a Elective (2)</b>
<b>Course Outcomes</b>
CO-1. Understand how to draw a simple random sample with replacement and without replacement and find best estimates for the population. CO-2. Find out the efficiency of various methods of sampling and decide the best method for the situations under consideration.

CO-3. Understand the applications of various simulation techniques.

<b>Department Name:</b>	<b>G 500P I</b>
	<b>B. Sc - ELECTRONICS</b>
<b>PROGRAMME OUTCOMES</b>	
PO-1. Ability to apply knowledge of Logic thinking and basic science for solving related problems PO2: Ability to perform experiments, as well as to analyse and interpret data. PO3: Ability to design and manage electronic systems or processes that conforms to a given specification within ethical and economic constraints. PO4:Ability to identify, formulate, solve and analyze the problems in various sub disciplines of Science. PO5:Ability to use Modern Tools / Techniques.	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
PSO1: Provide students with learning experiences that develop broad knowledge and understanding of key concepts of and equip students with advanced scientific / technological capabilities for analyzing and tackling the issues and problems in the field of. PSO2: Develop ability in students to apply knowledge and skills they have acquired to solve specific theoretical and applied problems in by providing hands on experience. PSO3: Develop abilities in students to design and develop innovative solutions for benefits of society. PSO4: Provide students with skills that enable them to get employment in industries or pursue Higher studies or research assignments or turn as entrepreneurs.	
<b>Semester- I</b>	
<b>Subject and code : FUNDAMENTALS OF ANALOG AND DIGITAL</b>	

<b>Course Code: G 504 DC1.1</b>
<b>Course Outcomes:</b>
<p>C01: Study and analyze basic networks using network theorems in systematic manner.</p> <p>C02: Build simple electronic circuits used in various applications.</p> <p>C03: Describe the behaviour of basic semiconductor devices</p> <p>C04: Reproduce the I-V characteristics of diode/BJT devices</p> <p>C05: Explain the behaviour, characteristics and applications of Varactor diode, LED, Zener diodes.</p> <p>C06: apply standard device models to explain/calculate critical internal parameters of semiconductor devices.</p> <p>C07: Understand and represent numbers in powers of base and converting one from the other, carry out simple arithmetic operations.</p> <p>C08: Understand the basic knowledge of Digital system building blocks, effectively can construct simple digital designs with the knowledge of Boolean algebra.</p>
<b>Subject and code: : PRACTICALS – I</b>
<b>Course Code: G 504 DC2.1P</b>
<b>Course Outcomes:</b>
C0-1. Successfully handle and complete practical problems connected with the experiments related to properties of matter.
<b>Subject and code: BASICS OF ELECTRONIC CIRCUITS AND PCB DESIGN</b>
<b>Course Code: : G 504 OE1.1 (OPEN ELECTIVE1)</b>
<b>Course Outcomes:</b>
<p>C01. Acquire knowledge of statistical methods.</p> <p>C02. Identify types of data and visualization, analysis and interpretation.</p> <p>C03. Know about elementary probability and probability models.</p> <p>C04. Employ suitable test procedures for the given data set.</p>
<b>Semester- II</b>
<b>Subject and code: DISCRETE AMPLIFIERS, OPERATIONAL AMPLIFIERS,</b>

**COMBINATIONAL CIRCUITS AND SEQUENTIAL CIRCUITS****Course Code: G 504DC1.2****Course Outcomes:**

CO1: design suitable biasing circuit to a transistor for specific application.  
CO2: explain performance parameters of any amplifier  
CO3: understand and appreciate the Fabrication of ICs  
CO4: understand the Fundamentals of Operational Amplifiers.  
CO5: interpret the experimental data for better understanding the ICs.  
CO6: understand linear and nonlinear applications of operational amplifiers.  
CO7: Analyze combinatorial and sequential circuits  
CO8: understands and interprets parameters of various Logic families

**Subject and code: Practical****Course Code: G 504 DC2.2P****Course Outcomes:**

CO1: design suitable biasing circuit to a transistor for specific application.  
CO2: explain performance parameters of any amplifier  
CO3: understand and appreciate the Fabrication of ICs  
CO4: understand the Fundamentals of Operational Amplifiers.  
CO5: interpret the experimental data for better understanding the ICs.  
CO6: understand linear and nonlinear applications of operational amplifiers.  
CO7: Analyze combinatorial and sequential circuits  
CO8: understands and interprets parameters of various Logic families

**Subject and code : ELE-OE1.2: RENEWABLE ENERGY AND ENERGY HARVESTING****Course Code: G 504 OE1.2****Course Outcomes:**

CO-1. Define basic properties of renewable energy sources.  
CO-2. Decide on the viability of a given energy harvesting technology in any given environment.  
CO-3. Acquire knowledge of energy storing systems.  
CO-4. Realize the environmental impact of renewable energy harvesting technologies.

<b>Semester- III</b>
<b>Subject and code: POWER CONTROL, OSCILLATORS, WAVE SHAPING CIRCUITS, PRINCIPLES OF RADIO COMMUNICATION AND DIGITAL CIRCUITS</b> <b>Course Code: G 504 DC1.3</b>
<b>Course Outcomes:</b>
CO1: Know the basic concept of breakdown devices. CO2: Understand the principles Oscillators. CO3: Analyse any wave shaping circuit. CO4: Understand the working of various types of Computer memories. CO5. Analyse the working of various memory organization. CO6. Understand the principles of Radio Communications. CO7: Familiar with “AM” and “FM “techniques. CO8: Understand Registers and Counters
<b>Subject and code: Domestic Equipment Maintenance</b> <b>Course Code: ELE-OE3.1:</b>
<b>Course Outcomes:</b>
CO1: Repair maintenance of the basic electrical and electronics appliances. CO2: Identification to protective devices. CO3: Repair and maintenance of the split AC and Refrigerators CO4: Able to do domestic wiring and maintenance.
<b>Semester- IV</b>
<b>Subject and code: Electronic Communications and Digital Computers</b> <b>Course Code: G 504 DC1.4</b>

<b>Course Outcomes:</b>
CO1: The history and development of Electronic communication system CO2: different channels of signal propagation in electronic communication systems CO3: working principles of common communication systems like Radio, television and cell phones CO4: principles of digital communication-mobile communication, internet and social media CO5: Knows principles of data storage using various memory devices. CO6: Knows the fundamentals of digital computer and its architecture.
<b>Subject and code: Practicals - IV</b>
<b>Course Code: G 504DC2.4P</b>
<b>Course Outcomes:</b>
CO1: The history and development of Electronic communication system CO2: different channels of signal propagation in electronic communication systems CO3: working principles of common communication systems like Radio, television and cell phones CO4: principles of digital communication-mobile communication, internet and social media CO5: Knows principles of data storage using various memory devices. CO6: Knows the fundamentals of digital computer and its architecture.
<b>Semester- V</b>
<b>Subject and code: Electronic Communications and Digital Computers</b>
<b>Course Code: G 504 DC1.4</b>
<b>Course Outcomes:</b>
CO1: The history and development of Electronic communication system CO2: different channels of signal propagation in electronic communication systems CO3: working principles of common communication systems like Radio, television and cell phones CO4: principles of digital communication-mobile communication, internet and social media

CO5: Knows principles of data storage using various memory devices.

CO6: Knows the fundamentals of digital computer and its architecture.

**Subject and code: 8085 MICROPROCESSOR AND 8051 MICROCONTROLLER**

**G 504.5B**

**Course Outcomes:**

CO1: understand the architecture of basic micro processors.

CO2: understand their instruction set and write simple programs in them

CO3: Know the application of microcontrollers in various fields

CO4: understand the architecture of any micro controller,

CO5: Understand the architecture of basic micro processors.

CO6: understand instruction set of microcontrollers and and write simple programs in them.

**Subject and code: G 504.5P: PRACTICALS V**

**Course Outcomes:**

CO1: Analyze and relate the working of Opto-electronic devices.

CO2: Understand and relate the characteristics of optical fibers and their simple applications,

CO3: Write programs in microcontrollers using the instruction set, code and execute the program.

**Semester- VI**

**Subject and code: – BIOMEDICAL INSTRUMENTS, VLSI AND ROBOTICS**

**G 504.6a**

**Course Outcomes:**

CO1: Know the human body electro- physiological parameters and recording of bio-potentials.

CO2: Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood flow meter etc.

CO3: Know about recent trends in medical instrumentation, Interpret the various

assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators.

CO4: Comprehend physical medicine methods eg. ultrasonic, shortwave, microwave surgical diathermies , and bio-telemetry principles and methods.

CO5: understand the fundamentals of VLSI, techniques and processes involved in developing VLSI.

CO6: Understand principles of Robotics and their role in Automation technology

**Subject and code: ELECTIVE I : 8086 MICROPROCESSOR & C LANGUAGE**

**G501.6b:**

**Course Outcomes:**

CO1: Learn the architecture of 8086 microprocessor.

CO2: Learn the instruction set of 8086 and write programs using them

CO3: Learn modular programming and I/O programming

CO4: Learn various features and structures of high level language by learning C language.

CO5: modular and structured programming techniques in C language.

**Subject and code: ELECTIVE 2:: FUNDAMENTALS OF DIGITAL SIGNAL PROCESSING**

**G 504.6b**

**Course Outcomes:**

CO1: Know characteristics of signal, classification and signal and system relationship.

CO2: Understand representation of signal using Fourier Transformation.

CO3: Understand Z-Transformation of signals and analysis.

CO4: Understand discrete Fourier Transformation of signals.

**Subject and code: G 504.6P – PRACTICALS – VI**

**Course Outcomes:**

CO1: After completion of this course students should be able to Understand the architecture and instructions of 8086 microprocessor by writing and executing programs in 8086 microprocessor.

CO2: Understand and relate the various programming options available in High level languages by writing and executing programs in C language.

CO3: Gain skills and confidence to develop/service electronic gadgets through project development.

CO4: To gain art of presenting any scientific findings in the form of a dissertation.

**Department  
Name:**

**G 500P J B.Sc.  
ECONOMICS**

**PROGRAMME OUTCOMES**

PO 1:Facilitate the understanding of basic economic theories.

PO 2: A comprehensive understanding of the various courses in the discipline.

PO 3: Enable to apply quantitative techniques suitable for the discipline.

PO 4: Analyse the policies of the government in solving economic problems.

PO 5: Develop skills required to blend the subject learned and the real life situations.

PO 6: Able to evaluate the working of the economy, its interconnection with the social, political, cultural, environmental, ethical issues in a comprehensive manner.

**PROGRAMME SPECIFIC OUTCOMES**

PSO 1: Enable the students with the knowledge of Economics both theoretical and applied.

PSO 2: Develop a comprehensive understanding of the various aspects of the branches of Economics related to micro and macro aspects.

PSO 3: Understand the working of the domestic and foreign economy.

PSO 4: Enable the students to apply the theoretical knowledge of Economics in applying to the real-life situations.

PSO 5: Analyse the issues related to various problems like unemployment, balance of payments, poverty, inequality, inflation facing the economy.

PSO 6: Develop skills to integrate and organise the inter linkages between and among the varied divisions of the economy.

PSO 7: Have a critical assessment of the working of the economy, the interconnections between the various sectors and the policies linked to the development.

**Semester- I**

**Subject and code: MICRO ECONOMICS I**

**COURSE CODE: G 513 DC1.1**

**Course Outcomes:**

CO 1. Analyse the economic behaviour of the consumer and the firm.

CO2. Explain the relationship between various variables such as Input and output, cost and output, price of the product and quantity demand.

CO3. Product and Factor pricing under different market structure..
<b>Subject and code: MATHEMATICS FOR ECONOMICS</b> <b>G 513 DC2.1</b>
<b>Course Outcomes:</b>
CO 1: Perform basic operations in Vectors and Matrix algebra. CO2. Calculate limits, derivatives and integrals of functions of multiple variables. CO3. Calculate Optima for constrained and unconstrained optimization problems encountered in Economics..
<b>Subject and code: DEVELOPMENT STUDIES</b> <b>G 513 OE1.1</b>
<b>Course Outcomes:</b>
CO 1 : Students will develop a critical understanding of the contemporary issues in Indian economic development. CO2: Students will thus be better prepared to face the professional world and can use this knowledge base in a variety of jobs, including in the corporate,
<b>Semester- II</b>
<b>Subject and code: MACRO ECONOMICS I</b> <b>G 513 DC1.2:</b>
<b>Course Outcomes:</b>
CO1: Explain the concept of National Income and methods of its estimation CO2: Analyse the relationship between Macroeconomic variables CO3: Understand the determination of income and employment under Classical and Keynesian framework
<b>Subject and code : STATISTICS FOR ECONOMICS</b> <b>G 513 DC 2.2:</b>
<b>Course Outcomes:</b>
CO 1: Calculate basic descriptive and inferential statistics. CO2. Interpret descriptive and inferential statistics. CO3. Explain the process of hypothesis testing.
<b>Subject and code: Economics of Business Environment</b> <b>G 513 OE 1.2:</b>
<b>Course Outcomes:</b>
CO 1: Explain the elements of Business environment. CO 2: Identify the environmental constraints in the growth of a business firm. CO 3: Analyze the ways to utilise the current environmental conditions to achieve higher business growth.
<b>Semester- III</b>
<b>Subject and code: Micro Economics II</b> <b>G 513 DC 1.3:</b>
<b>Course Outcomes:</b>

CO 1: Identify the facets of an economic problem.  
 CO 2: Learn basic economic concepts and terms.  
 CO 3: Explain the operation of a market system.  
 CO 4: Analyse the production and cost relationship of a business firm.  
 CO 5: Evaluate the market decisions under different structure.  
 CO 6: Use basic cost benefit calculations as a means of decision making.

**Subject and code: BASIC ECONOMETRICS**

G 513 DC 2.3:

**Course Outcomes:**

CO 1 To know the basic knowledge of Econometrics.  
 CO2 To understand the concepts like multicollinearity, heteroscedasticity.  
 Autocorrelation and their applications.  
 CO3 Helps the students to solve analytical problems related to regression.

**Subject and code: Economics of Insurance**

G 513 OE 1.3:

**Course Outcomes:**

CO 1: Understand various types of Insurance  
 CO 2: Understand various risks and Benefits of Insurance

**Semester- IV**

**Subject and code: Macro Economics**

G 513 DC1.4:

**Course Outcomes:**

CO 1: On successful completion of the course the student is expected to get  
 CO2: a thorough understanding of the various theories behind pricing of products and factors in different market environment.  
 CO 3: Ability to identify and evaluate the main models of market structures and to appreciate the theories behind policy prescriptions.  
 CO 4: This course in Macroeconomics is expected to develop skill in economic reasoning. By the time, students complete this course, they would know the relevance of government decisions like Wage policy, monetary policy, the RBI policy, etc. in the day-to-day life.

**Subject and code: APPLIED ECONOMETRICS**

G 513 DC 2.4:

**Course Outcomes:**

CO 1: To know the basic knowledge of Econometrics.  
 CO2: To understand the dynamic econometric models.  
 CO3: Helps to improve analytical skills..

**Subject and code: Entrepreneurial Economics**

G 513 OE 1.4:

<b>Course Outcomes:</b>
CO 1: Understand various concepts of entrepreneurship CO 2: Absorb Skills of entrepreneurship CO 3: Understand various sources of financing project
<b>Semester- V</b>
<b>Subject and code: G513:5a: MATHEMATICAL ECONOMICS</b>
<b>Course Outcomes:</b>
CO1: Demonstrate a knowledge and understanding of the mathematical concepts and methods used in economics CO2: Demonstrate the facility to express economic ideas in the language of mathematics. CO3: Analyze and evaluate economic models by using formal mathematical methods. CO4: Demonstrate an understanding of the rules of differentiation as they apply to multivariable functions CO5: Find solutions to unconstrained optimization problems by identifying relative and global maximums and minimums of single and multivariable functions CO6: Use integration and matrix algebra techniques in economic analysis
<b>Subject and code: G 513. 5b: DEVELOPMENT ECONOMICS</b>
<b>Course Outcomes:</b>
CO 1: A comprehensive understanding of economic progress and welfare. Students will be equip to calculate various indices like HDI, GDI, GII & MPI. CO 2 : A detail analysis on various country profiles and understanding the development models adopted by those countries. CO 3 : Helps to select appropriate model for the economic development and growth of the countries. CO 4 : Capital budgeting tools equip the students to make a best decision in selecting the projects. CO 5 : An attempt is made to critically evaluate population as growth promoting factor or retarding factor. CO 6 : Helps to understand the interlinkages between agriculture and industry, there by economic development
<b>Semester- VI</b>
<b>Subject and code: G 513.6a: INDIAN ECONOMICS</b>
<b>Course Outcomes:</b>
CO 1: Understand the nature of Indian Economy, GDP, demographic profile, natural resources. CO 2: Informative about all the three sectors and sectoral reforms, economic planning and steps taken for development of Indian Economy. CO 3: Students will be knowledgeable about fundamental problems of Indian economy. CO 4: Be informative about various initiatives of the Government of India to irradiate

poverty and provide employment.

CO 5: Be aware about reforms of different sectors of Indian economy.

CO 6: Students will understand the importance of different institution like NITI Aayog and Panchayath Raj in India.

**Subject and code: G 513.6b: ECONOMETRICS**

**Course Outcomes:**

CO 1: Helps to understand the application of econometrics in various field like commerce, management, science and economics etc.

CO 2 : Regression model in the economic theories & problems will be applied to find the best statistical inference.

CO 3 : A comprehensive understanding of dummy variable using statistical software.

CO 4 : To equip the students to understand the inconsistency of OLS method.

CO 5 : To understand the game theory and its applications.

CO 6 : Research methodology helps to study the different paradigms of research and its applications in various fields.

**Department  
Name:**

**G 500B A B.Sc.  
BIOCHEMISTRY**

**PROGRAMME OUTCOMES**

PO 1 To create interest in Biochemistry and appreciation for chemical basis of biological processes.

PO2 To inculcate the spirit of inquiry and value of systematic study of a discipline. Provides general understanding of the related disciplines with a holistic knowledge generation in biological sciences.

PO3 To provide an in-depth understanding of chemical reaction mechanisms in biological processes.

PO4 To provide a flavor of historical developments of enzymes and their applications in research, diagnostics and various industries.

PO5 Gain proficiency in basic laboratory techniques and be able to apply the scientific method to the processes of experimentation, hypothesis testing, data interpretation and logical conclusions.

PO6 Develop problem solving and analytical skills through case studies, research papers

and hands-on-experience

PO7 To appreciate biochemical mechanistic basis of physiological processes, metabolism under normal and pathological conditions importance and levels of metabolic regulations.

PO8 To apply and effectively communicate scientific reasoning and data analysis in both written and oral forms. They will be able to communicate effectively with well-designed posters and slides in talks aimed at scientific audiences as well as the general public.

PO9 To bridge the knowledge and skill gap between academic out and industry requirements.

PO10 To give students experience in conducting independent, hypothesis- driven, biological research, project planning and management

PO 11 To provide skills to publish research findings, and awareness of IP rights, and scientific publication ethics and problems of plagiarism.

PO 12 : To prepare competent human resource with better knowledge, hands-on-experience and scientific attitude, at national and global levels for careers in research and development, academia and Pharma-, biotech- and agro-, and food processing industries.

### **PROGRAMME SPECIFIC OUTCOMES**

PSO.1:Describe the chemical structures, properties, and biological functions of the molecules which make up living matter: water, amino acids and proteins, nucleic acids, carbohydrates, and lipids.

PSO.2:Describe methods to study the structures of these molecules and to synthesize them.

PSO.3•Describe the mechanisms by which the structures of proteins determine their functions and by which their functions are regulated.

PSO.4:Explain how enzymes function in terms of thermodynamics, transition states, and kinetics. Perform calculations involving various kinetic parameters, including  $K_M$  and  $V_{max}$ .

PSO.5: Contrast the effects of different types of inhibitors on enzymes and on their kinetic parameters.

PSO.6: Describe the mechanisms of action of selected enzymes and the experimental evidence for these mechanisms.

PSO.7: Explain how enzyme activity is regulated by various means.

PSO.8: Define thermodynamic parameters, including free energy, entropy and reduction potentials. Perform calculations involving them.

PSO.9: Discuss the role of ATP in the thermodynamics of metabolism.

PSO.10:Describe the metabolic roles of NADH, NADPH, FADH<sub>2</sub>, coenzyme A, water & fat soluble vitamins and ribonucleotides.

PSO.11:Name and describe the molecules which participate in selected metabolic pathways, such as glycolysis, citric acid cycle, and gluconeogenesis. Discuss the enzymes and cofactors catalyzing each transformation in these metabolic pathways and the controls on the pathways studied.

PSO.12:Summarize the pathways providing monosaccharides for glycolysis, emphasizing the interacting controls of these processes.

PSO.13:Explain DNA replication, transcription , translation, DNA recombination and DNA damages

PSO.14:Summarizes DNA mutation and cancer, radiotherapy.

PSO.15:Describe basics in microbiology and immunology

PSO.16:Demonstrate techniques in microbiology, immunology and cell biology.

### Semester- I

**Subject and code: Chemical Foundations Of Biochemistry – I**  
**G 510 DC 1.1**

**Course Outcomes:**

CO1: This will inculcate confidence and clarity of mind in students to understand the chemistry of Biomolecules and Biological reactions

**Subject and code: Volumetric analysis & Estimations –Practical-I**  
**G 510 DC 2.1P**

**Course Outcomes:**

CO1: To familiarize students with the principles of analytical chemistry and basic analytical techniques such as volumetric analysis.

CO2: To provide experimental practice of quantitative volumetric analysis.

CO3: To make solutions of various molar, normal concentrations and determine the amount of a substance in a given sample.

**Subject and code: BIOCHEMISTRY IN HEALTH AND DISEASE**  
**G 510 OE 1.1**

**Course Outcomes:**

CO1:This open elective course offering to students of various streams gives knowledge about health and various terminologies used in health and disease conditions;

CO2: Difference between communicable & non-communicable diseases; Health promotion

CO3:treatments for various diseases & disorders..

**Subject and code: BIOCHEMISTRY OF CELL**  
**G 510 OE 1.2**

**Course Outcomes:**

CO1:This open elective course offering to students of various streams gives knowledge about biomolecules in their cellular environment.

CO2: Further, they will learn basic chemistry of amino acids, peptides, sugars, polysaccharides, nucleosides, nucleotides, nucleic acids, lipids, vitamins, coenzymes

and metal ions.
<b>Semester- II</b>
<b>Subject and code: Chemical Foundations Of Biochemistry – II</b> <b>G 510 DC 1.2</b>
<b>Course Outcomes:</b>
CO1: These topics will enable students to understand the fundamentals of chemical processes in biological systems.
<b>Subject and code : Qualitative and Quantitative Analysis Practicals – II</b> <b>G 510 DC 2.2P</b>
<b>Course Outcomes:</b>
CO 1: The Course Objective is to provide experimental practice of quantitative and qualitative analysis. CO2: Also it provides training in physical chemistry laboratory techniques. CO3: Upon successful completion, students should develop skills in handling instruments and understand its application in research work..
<b>Subject and code: NUTRITION AND DIETETICS</b> <b>G 510 OE 1.2:</b>
<b>Course Outcomes:</b>
CO 1: The student will gain knowledge about energy requirements and the Recommended Dietary Allowances. CO2: The student will understand the functions and role of macronutrients, their requirements, its deficiency and its excess effects. CO3: The student will be able to apply basic nutrition knowledge in making food choices and obtaining an adequate diet. CO4: The student gains competence in connecting the role of various nutrients maintaining health and learn to enhance traditional recipes..
<b>Subject and code: PROTEINS AND ENZYMES</b> <b>G 510 OE 1.2:</b>
<b>Course Outcomes:</b>
CO 1: Proteins: The course aims to introduce proteins and their importance to modern Biochemistry, highlighting their structural features and unique characteristics that help them participate in every physiological process in life. CO2: Enzymes: The objective of this course is to integrate the practical aspects of enzymology with the kinetic theories to provide a mechanistic over view of enzyme activity and regulation in the cell. CO3: To prepare students to confidently and competently work with enzyme systems in both Academia and industry.
<b>Semester- III</b>
<b>Subject and code: BIO-ORGANIC CHEMISTRY</b>

<b>G 510 DC1. 3:</b>
<b>Course Outcomes:</b>
CO 1 :These topics will enable students to understand the fundamentals of organic chemistry pertinent to their importance in understanding biochemical reactions.
<b>Subject and code: BIOORGANIC CHEMISTRY -3 PRACTICALS</b>
<b>G 510 DC 2.3P:</b>
<b>Course Outcomes:</b>
CO 1 :This course aims to familiarize students with the principles of organic chemistry and basic qualitative analysis of organic compounds. CO2: Course objective is to provide experimental practice of preparation of organic compounds and extraction of biologically important compounds.
<b>Subject and code: BIOCHEMICAL TECHNIQUES</b>
<b>G 510 OE 1.3:</b>
<b>Course Outcomes:</b>
Co1:Demonstrate the ability to use discipline specific research techniques. CO2:Analyze and interpret data and scientific literature. Synthesize data and draw appropriate inferences.
<b>Subject and code :</b>
<b>Course Outcomes:</b>
<b>Semester- IV</b>
<b>Subject and code: ANALYTICAL BIOCHEMISTRY</b>
<b>G 510 DC1.4:</b>
<b>Course Outcomes:</b>
CO 1: These topics will enable students to develop competence in handling various chromatographic, electrophoretic and isotopic techniques and apply them in isolating and characterizing different biological molecules.
<b>Subject and code: Analytical Biochemistry – IV</b>
<b>G 510 DC 2.4P:</b>
<b>Course Outcomes:</b>
CO 1: Sourcing and handling biological samples. CO2: Develop skill and proficiency in basic techniques CO3: Centrifugation CO4: Chromatography CO5: Electrophoresis and CO6: Spectroscopy
<b>Subject and code: PLANT BIOCHEMISTRY</b>
<b>G 510 OE 1.4:</b>
<b>Course Outcomes:</b>
CO1:Understand the plant cell, photosynthesis, transporters, and important

primary metabolites.

CO2: Illustrate plant growth regulators, plant's responses to various biotic and abiotic stresses.

CO3: Explain about plant secondary metabolites and their functional importance.

### **Semester- V**

**Subject and code: MOLECULAR BIOLOGY G510.5a**

**Course Outcomes:**

CO.1 Students will acquire basic information about the structure of DNA and various forms of DNA, about organization of genome in various life forms, supercoiling of DNA and its significance

CO.2 Students will learn about the molecular basis of processes like DNA replication, recombination and transposition and understand the significance of these processes

CO.3 Acquire basic knowledge about the processes of transcription and translation in prokaryotes and eukaryotes

CO.4 Learn about the features of the genetic code and various experimental approaches used to crack the code

CO.5 Develop understanding of the molecular basis of RNA processing and RNA splicing

CO.6 Learn about the various ways in which these biological processes are regulated and the significance of regulation in maintaining life forms

CO.7 Students will learn about the various ways in which the DNA can be damaged leading to mutations and lesions and different ways to repair DNA damage, DNA recombination.

**Subject and code: GENETIC ENGINEERING AND BIOTECHNOLOGY G510.5b**

**Course Outcomes:**

CO.1 The process for isolation and engineering of DNA using restriction and modification enzymes.

CO.2 Use of cloning and expression vectors.

CO.3 The methods for creation of genomic and cDNA libraries, their applications and use.

CO.4 Understand IPR and ethical issues in Biotechnology

CO.5 Gain knowledge on tissue culture media and techniques

CO.6 Understanding the methods for antibiotic alcoholic and non alcoholic production at industry

**Subject and code: G 510.5P (Molecular Biology and Biotechnology) `Practicals**

**Course Outcomes:**

CO.1 The process for isolation and engineering of DNA using restriction and modification enzymes.

CO.2 Use of cloning and expression vectors.

CO.3 The methods for creation of genomic and cDNA libraries, their applications and use.

CO.4 Learn about the various ways in which these biological processes are regulated and the significance of regulation in maintaining life forms

## **Semester- VI**

**Subject and code: MICROBIOLOGY AND IMMUNOLOGY G 510.6a**

### **Course Outcomes:**

CO.1 Trace the history and developments in microbiology.

CO.2 Have an overview of the culture and staining techniques for bacteria, viruses and microbial nutrition

CO.3 Understand the immune system including cells, organs and types of immunity.

CO.4 Describe the basic mechanism, differences and functional interplay of innate and adaptive immunity

CO.5 Understand Antigens & its Recognition, antigen processing and presentation

CO.6 Understand the structure & functions of different classes of Immunoglobulins, and techniques like ELISA, RIA and immunodiffusion

CO.7 Define the cellular and molecular pathways of humoral and cell-mediated immune responses

CO.8 Describe the mechanisms involved in different types of hypersensitivity

CO.9 Explain the autoimmunity and grafting

CO.10 Understand complement pathways in detail

**Subject and code: CLINICAL & MEMBRANE BIOCHEMISTRY G510.6b**

### **Course Outcomes:**

CO.1 Learn about urine, blood and related disorder in detail.

CO.2 They will understand the cell membrane structure, functions, ionophores and active transport mechanism

CO.3 Introduced to basic concepts radioactivity, its measurements

CO.4 Gain knowledge about the radiation hazards and safety

CO.5 Get knowledge about the carcinogens, cancer and its types

CO.6 Acquire insight into cancer diagnosis and treatment

**Subject and code: G510.6P (Microbiology& Clinical Biochemistry) Practicals**

### **Course Outcomes:**

CO.1 Learn about urine, blood and related disorder in detail.

CO.2 They will understand the cell membrane structure, functions, ionophores and active transport mechanism

CO.3 Introduced to basic concepts radioactivity, its measurements

CO.4 Describe the mechanisms involved in different types of hypersensitivity

CO.5 Explain the autoimmunity and grafting


<b>Department Name:</b>	<b>G 500B A B.Sc. ZOOLOGY</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO 1: The Programme offers both classical as well as modern concepts of Zoology in higher education.</p> <p>PO 2: It enables the students to study animal diversity in both local and global environments</p> <p>PO 3: To make the study of animals more interesting and relevant to human studies more emphasis is given to branches like behavioural biology, evolutionary biology and economic zoology.</p> <p>PO 4: More of upcoming areas in cell biology, genetics, molecular biology, biochemistry, genetic engineering and bioinformatics have been also included.</p> <p>PO 5: The lab courses provide the students necessary skills required for their employability. Equal importance is given to practical learning and presentation skills of students.</p> <p>PO 6: -Skill enhancement courses in classical and applied branches of Zoology enhance enterprising skills of students</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO 1`To recognize the relationships between structure and function at different levels of biological organization (e.g., molecules, cells, organs, organisms, populations, and species) for the major groups of animals.</p> <p>PSO 2 Enable to understand how organisms function at the level of the gene, genome, cell, tissue, organ and organ-system. Drawing upon this knowledge, they are able to give specific examples of the physiological adaptations, development, reproduction and behaviour of different forms of life.</p> <p>PSO 3 To understand the applied biological sciences or economic Zoology such as sericulture, apiculture, aquaculture, Industrial microbiology, rDNA technology and medicine for their career opportunities.</p>	
<b>Semester- I</b>	
<b>Subject and code: Cytology, Genetics and Infectious Diseases</b>	

<b>G 508 DC 1.1</b>
<b>Course Outcomes:</b>
C01. The structure and function of the cell organelles. C02. The chromatin structure and its location. C03. The basic principle of life, how a cell divides leading to the growth of an Organism and also reproduces to form a new organism. C04. How a cell communicates with its neighbouring cells. C05:. The principles of inheritance, Mendel 's laws and the deviations. C06:. How environment plays an important role by interacting with genetic factors. C07:. Detect chromosomal aberrations in humans and study of pedigree analysis
<b>Subject and code: Cytology, Genetics and Infectious Diseases</b>
<b>G 508. DC 1.1P</b>
<b>Course Outcomes:</b>
C01. The structure and function of the cell organelles. C02. The chromatin structure and its location. C03. The basic principle of life, how a cell divides leading to the growth of an Organism and also reproduces to form a new organism. C04. How a cell communicates with its neighbouring cells. C05:. The principles of inheritance, Mendel 's laws and the deviations. C06:. How environment plays an important role by interacting with genetic factors. C07:. Detect chromosomal aberrations in humans and study of pedigree analysis
<b>Subject and code: Economic Zoology</b>
<b>G 508 OE 1.1</b>
<b>Course Outcomes:</b>
CO1. Gain knowledge about silkworms rearing and their products. CO2. Gain knowledge in Bee keeping equipment and apiary management. CO3. Acquaint knowledge on dairy animal management, the breeds and diseases of cattle and learn the testing of egg and milk quality. CO4. Acquaint knowledge about the culture techniques of fish and poultry. CO5. Acquaint the knowledge about basic procedure and methodology of vermiculture. CO6. Learn various concepts of lac cultivation. CO7. Students can start their own business i.e. self-employments. CO8. Get employment in different applied sectors
<b>Semester- II</b>
<b>Subject and code: Biochemistry and Physiology</b>
<b>G 508 DC 1.2</b>
<b>Course Outcomes:</b>

CO1. To develop a deep understanding of structure of biomolecules like proteins, lipids and carbohydrates.  
 CO 2. How simple molecules together form complex macromolecules.  
 CO 3. To understand the thermodynamics of enzyme catalyzed reactions.  
 CO 4. Mechanisms of energy production at cellular and molecular levels.  
 CO 5. To understand various functional components of an organism.  
 CO 6. To explore the complex network of these functional components.  
 CO 7. To comprehend the regulatory mechanisms for maintenance of function in the body

**Subject and code: Biochemistry and Physiology**

**G 508 DC 1.2P**

**Course Outcomes:**

CO1 . To develop a deep understanding of structure of biomolecules like proteins, lipids and carbohydrates.  
 CO 2. How simple molecules together form complex macromolecules.  
 CO 3. To understand the thermodynamics of enzyme catalyzed reactions.  
 CO 4. Mechanisms of energy production at cellular and molecular levels.  
 CO 5. To understand various functional components of an organism.  
 CO 6. To explore the complex network of these functional components.  
 CO 7. To comprehend the regulatory mechanisms for maintenance of function in the body

**Subject and code: Parasitology**

**G 508 OE 1.2:**

**Course Outcomes:**

CO 1: Know the stages of the life cycles of the parasites and infective stages.  
 CO2. Develop ecological model to know population dynamics of parasite, establishment of parasite population in host body, adaptive radiations and methods adopted by parasite to combat with the host immune system.  
 CO3. Develop skills and realize significance of diagnosis of parasitic infection and treatment.  
 CO4. Understand about diseases caused by Protozoa, Helminthes, Nematodes and Arthropods at molecular level.  
 CO5. Develop their future career in medical sciences and related administrative services.

**Semester- III**

**Subject and code: Molecular Biology, Bioinstrumentation and Techniques in Biology**

**G508DC2.3**

**Course Outcomes:**

CO 1 : Describe the organization of macromolecules on membranes and cellular processes.  
 CO2: Differentiate the various cell signaling pathways.  
 CO3: Illustrate regulation of gene expression in eukaryotes.

CO4: Take up research in the field of cell and molecular biology.
<b>Subject and code: Molecular Biology, Bioinstrumentation and Techniques in Biology</b> G508DC2.3P
<b>Course Outcomes:</b>
CO 1 : Describe the organization of macromolecules on membranes and cellular processes. CO2: Differentiate the various cell signaling pathways. CO3: Illustrate regulation of gene expression in eukaryotes. CO4: Take up research in the field of cell and molecular biology.
<b>Subject and code: Endocrinology</b> G 508 OE 2.3E:
<b>Course Outcomes:</b>
CO1: To explain the roles of the endocrine system in maintaining homeostasis, integrating growth and development, responding to environmental insults and promoting successful reproduction. CO2 To discuss the definition of a hormone in terms of its general properties.
<b>Semester- IV</b>
<b>Subject and code: Gene Technology , Immunology and Computational Biology</b> G508.DC2.4
<b>Course Outcomes:</b>
CO 1: Provide students with knowledge on how the immune system works during bacterial infection and viral infection CO2: Describe which cell types and organs present in the immune response. CO3: Apply basic techniques for identifying antigen-antibody interactions. CO4: Elucidate the reasons for immunization and aware of different vaccination
<b>Subject and code: Gene Technology , Immunology and Computational Biology</b> G508.DC2.4P
<b>Course Outcomes:</b>
CO 1: Provide students with knowledge on how the immune system works during bacterial infection and viral infection CO2: Describe which cell types and organs present in the immune response. CO3: Apply basic techniques for identifying antigen-antibody interactions. CO4: Elucidate the reasons for immunization and aware of different vaccination
<b>Subject and code: Animal Behavior</b> G 508 OE 1.4E:
<b>Course Outcomes:</b>
CO1:To understand what triggers behaviour and the importance of behaviour in an animal's chances of survival and reproductive success;

CO2: To gain a general knowledge of the development of the field of animal behaviour and how it is linked to related fields such as neurobiology and behavioural ecology.

## **Semester- V**

**Subject and code: Histology, Reproductive and Developmental Biology G508.5A**

### **Course Outcomes:**

CO1. Identify the histological structures of various organs in relation with their functions.  
CO2. Understand the basic principles of microtomy and differential staining technique, before focusing on the structure and function of mammalian tissues, and the relationships between them;  
CO3. .Describe the structure, functions and biological principles of reproductive system  
CO4. Identify the developmental stages of chick , frog and human foetus.  
CO 5. Describe the key events in early and systematic embryological development.  
CO6. Apply the understanding of concepts in reproductive biology to life.

**Subject and code: HISTOLOGY, REPRODUCTIVE AND DEVELOPMENTAL BIOLOGY G 508.5P (Practicals)**

### **Course Outcomes:**

CO1. Identify the histological structures of various organs in relation with their functions.  
CO2. Understand the basic principles of microtomy and differential staining technique, before focusing on the structure and function of mammalian tissues, and the relationships between them;  
CO3. .Describe the structure, functions and biological principles of reproductive system  
CO4. Identify the developmental stages of chick , frog and human foetus.  
CO 5. Describe the key events in early and systematic embryological development.  
CO6. Apply the understanding of concepts in reproductive biology to life.

**Subject and code: ECOLOGY, BIOSTATISTICS, ETHOLOGY AND WILDLIFE BIOLOGY G 508.5B**

### **Course Outcomes:**

CO1. Understand the general principles of ecology as to how they related to terrestrial and aquatic (plant and animal ) conservation and management.  
CO2. Identify species, characteristics, habitat requirements and behaviour of birds, fish, mammals etc.  
CO3. Apply knowledge to solve problems related to wildlife conservation and management.  
CO4. Acquire knowledge of how wildlife conservation and management relates to the economy and environment, both currently and in the future.  
CO 5. Use contemporary biostatistical tools and techniques for studying animal populations.

CO6. Familiarize with a variety of laws and regulations that influence how natural resources are used and protected.

**Subject and code: ECOLOGY, BIOSTATISTICS, ETHOLOGY AND WILDLIFE BIOLOGY G 508.5P (Practical)**

**Course Outcomes:**

CO1. Understand the general principles of ecology as to how they related to terrestrial and aquatic (plant and animal ) conservation and management.

CO2. Identify species, characteristics, habitat requirements and behaviour of birds, fish, mammals etc.

CO3. Apply knowledge to solve problems related to wildlife conservation and management.

CO4.Acquire knowledge of how wildlife conservation and management relates to the economy and environment, both currently and in the future.

CO 5. Use contemporary biostatistical tools and techniques for studying animal populations.

CO6. Familiarize with a variety of laws and regulations that influence how natural resources are used and protected.

**Semester- VI**

**Subject and code: GENETICS, EVOLUTION AND PALEONTOLOGY G508.6A**

**Course Outcomes:**

CO1. Understand the fundamental concepts in Genetics.

CO2. Explain Mendelian segregation, independent assortment and linkage

CO3.Apply the principles of Mendelian inheritance and their extensions (one-and two-locus traits with two or more alleles, gene interactions, sex linkage and linkage) by analyzing inheritance patterns from crosses

CO4. Describe the origin and genetic consequences of mutations and chromosomal abnormalities

CO 5. Analyze the allele and genotypic frequencies within populations based on the Hardy-Weinberg law

CO6. Familiarize with the basic processes in population genetics such as mutation, migration, natural selection, sexual selection and genetic drift.

CO7. Understand the processes of speciation and extinction and the theories of origin of life.

**Subject and code: GENETICS, EVOLUTION AND PALEONTOLOGY G 508.6P(Practical)**

**Course Outcomes:**

CO1. Understand the fundamental concepts in Genetics.

CO2. Explain Mendelian segregation, independent assortment and linkage

CO3.Apply the principles of Mendelian inheritance and their extensions (one-and two-locus traits with two or more alleles, gene interactions, sex linkage and linkage) by

analyzing inheritance patterns from crosses CO4. Describe the origin and genetic consequences of mutations and chromosomal abnormalities CO 5. Analyze the allele and genotypic frequencies within populations based on the Hardy-Weinberg law CO6. Familiarize with the basic processes in population genetics such as mutation, migration, natural selection, sexual selection and genetic drift. CO7. Understand the processes of speciation and extinction and the theories of origin of life.
<b>Subject and code: APPLIED ZOOLOGY, PARASITOLOGY, TOXICOLOGY AND CANCER BIOLOGY G508.6B</b>
<b>Course Outcomes:</b>
CO1. Identify and classify different species and breeds of cattle, poultry, silk moths, earthworms, honey bees, prawns, fishes and shellfishes. CO2. Understand the morphology, life cycle of different parasites. CO3. Explain the epidemiology, diagnosis and treatment of vector-borne diseases. CO4. Apply the knowledge in parasitology to prevent diseases. CO 5. Understand the concepts of Toxicology and cancer biology. CO6. Analyze the effect of carcinogens and toxins on living organisms.
<b>Subject and code: APPLIED ZOOLOGY, PARASITOLOGY, TOXICOLOGY AND CANCER BIOLOGY G 508.6P (Practical)</b>
<b>Course Outcomes:</b>
CO1. Identify and classify different species and breeds of cattle, poultry, silk moths, earthworms, honey bees, prawns, fishes and shellfishes. CO2. Understand the morphology, life cycle of different parasites. CO3. Explain the epidemiology, diagnosis and treatment of vector-borne diseases. CO4. Apply the knowledge in parasitology to prevent diseases. CO 5. Understand the concepts of Toxicology and cancer biology. CO6. Analyze the effect of carcinogens and toxins on living organisms.

<b>Department Name:</b>	<b>G 500B B B.Sc. BOTANY</b>
<b>PROGRAMME OUTCOMES</b>	
PO1. Get an opportunity in further studies, research and employment in various areas of	

life sciences

PO2. Enhance their knowledge in the field of life sciences and are able to handle laboratory equipments and experimentation for higher education leading to research

PO3. Enhance the scope of employability by obtaining all-round knowledge in the allied subjects along with Botany.

PO4. Develop an awareness towards the environment, biodiversity, conservation and their significance.

PO5. Equip themselves for competitive examinations

PO6. Inculcate an interest for nature and the need to preserve the nature by maintaining green house, herbal gardens in the campus and environs.

### **PROGRAMME SPECIFIC OUTCOMES**

PSO1: Able to get an opportunity in further studies, research and employment in various areas of plant sciences.

PSO2: To receive the updated subject matter, both theoretical as well as practical, such a way to foster their core competency, creative thinking and analytical learning .

PSO3: A botany graduate as envisioned in this framework would be sufficiently competent in the field to undertake further discipline-specific studies, as well as to begin domain-related employment.

PSO4: To enhance their knowledge in the field of life sciences and are able to handle laboratory equipments and experimentation for higher education leading to research

PSO5: To become a responsible citizen who is aware of the most basic domain-independent knowledge, including critical thinking and communication.

PSO6: enhance the scope of employability by obtaining all-round knowledge in the allied subjects along with Botany.

PSO7: To develop an awareness towards the environment, biodiversity, conservation and their significance.

PSO8: To promote and popularize the study of Botany for its importance and its social relevance

PSO9: To equip themselves for competitive examinations enabling the graduates to prepare for national as well as international competitive examinations, including UGC-CSIR NET and UPSC Civil Services Examination.

PSO10: To inculcate an interest for nature and the need to preserve the nature by

maintaining greenhouse, herbal gardens in the campus and environs
<b>Semester- I</b>
<b>Subject and code: MICROBIAL DIVERSITY AND TECHNOLOGY G 507 DC1.1</b>
<b>Course Outcomes:</b>
CO1: understand the fascinating diversity, evolution, and significance of microorganisms. CO2: comprehend the systematic position, structure, physiology and life cycles of microbes and their impact on humans and environment. CO3: gain laboratory skills such as microscopy, microbial cultures, staining, identification and preservation of microbes. CO4: apply microbes in research and industry
<b>Subject and code: MICROBIAL DIVERSITY AND TECHNOLOGY -PRACTICALS G 507 DC 2.1P</b>
<b>Course Outcomes:</b>
CO1: understand the fascinating diversity, evolution, and significance of microorganisms. CO2: comprehend the systematic position, structure, physiology and life cycles of microbes and their impact on humans and environment. CO3: gain laboratory skills such as microscopy, microbial cultures, staining, identification and preservation of microbes. CO4: apply microbes in research and industry
<b>Subject and code: PLANTS FOR HUMAN WELFARE G 507 OE 1.1</b>
<b>Course Outcomes:</b>
CO1: gain knowledge on the economic importance of diverse plants that offer resources to human life. CO2: know about the plants used as food, medicinal value and also plant sources of different economic value . understand the importance of plants in today's life, conservation, ecosystem and sustainability.
<b>Semester- II</b>
<b>Subject and code: DIVERSITY OF NON- FLOWERING PLANTS G507 DC1.2</b>
<b>Course Outcomes:</b>
CO1. understand the diversity and affinities among Algae, Bryophytes, Pteridophytes and Gymnosperms. CO2: understand the morphology, anatomy, reproduction and life cycle across Algae,

<p>Bryophytes, Pteridophytes and Gymnosperms.</p> <p>CO3: understand the ecological and evolutionary significance.</p> <p>CO4: obtain laboratory skills/explore non-flowering plants for their commercial applications.</p>
<p><b>Subject and code: DIVERSITY OF NON- FLOWERING PLANTS - PRACTICALS</b>  <b>G507DC 2.2P</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO1. understand the diversity and affinities among Algae, Bryophytes, Pteridophytes and Gymnosperms.</p> <p>CO2: understand the morphology, anatomy, reproduction and life cycle across Algae, Bryophytes, Pteridophytes and Gymnosperms.</p> <p>CO3: understand the ecological and evolutionary significance.</p> <p>CO4: obtain laboratory skills/explore non-flowering plants for their commercial applications.</p>
<p><b>Subject and code: PLANT PROPAGATION, NURSERY MANAGEMENT AND GARDENING G</b>  <b>G 507 OE 1.2</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO 1: gain knowledge of gardening, cultivation, multiplication, raising of seedlings of garden plants.</p> <p>CO2: get knowledge of new and modern techniques of plant propagation.</p> <p>CO3: develop interest in nature and plant life.</p> <p>CO4: understand the application of this field in floriculture, agriculture and medicine</p> <p>CO5: practice sustainable use of plant resources</p>
<p><b>Semester- III</b></p>
<p><b>Subject and code: PLANT ANATOMY AND DEVELOPMENTAL BIOLOGY</b>  <b>G507 DC1.3</b></p>
<p><b>Course Outcomes:</b></p>

CO 1 : Understand various levels of organization in a plant body with an outlook in the relationship between the structure and function through comparative studies.  
 CO2. Observe and classify the floral variations from the premises of college and house.  
 CO3. Understand the various reproductive methods sub-stages in the life cycle of plants  
 CO4. Observe and classify the embryological variations in angiosperms.  
 CO5. Understand evolution based on the variations in reproduction among plants.

**Subject and code: Molecular Biology, Bioinstrumentation and Techniques in Biology**

**G507 DC2.3P**

**Course Outcomes:**

CO 1 : Understand various levels of organization in a plant body with an outlook in the relationship between the structure and function through comparative studies.  
 CO2. Observe and classify the floral variations from the premises of college and house.  
 CO3. Understand the various reproductive methods sub-stages in the life cycle of plants  
 CO4. Observe and classify the embryological variations in angiosperms.  
 CO5. Understand evolution based on the variations in reproduction among plants.

**Subject and code: : Medicinal and Aromatic plants**

**G 507 OE 1.3**

**Course Outcomes:**

CO1: understand the concept of plant based medicine  
 CO2: know the Medico-ethnobotanical sources  
 CO3: identify medicinal and aromatic plants

**Semester- IV**

**Subject and code: Ecology and Conservation Biology**

**G507 DC1.4**

**Course Outcomes:**

CO 1 learn various types of ecosystems and its significance in biodiversity conservation  
 CO2. understand ecological concepts like succession and plant adaptations, concept of sustainability  
 CO3. learn the practical application of research methodologies in ecology with reference to community studies  
 CO4. evaluate sustainable management related to local and global issues  
 CO5. get knowledge on the recent issues associated with the environment

**Subject and code: Ecology and Conservation Biology**

**G 507 DC 2.4 P**

**Course Outcomes:**

CO 1 learn various types of ecosystems and its significance in biodiversity conservation  
 CO2. understand ecological concepts like succession and plant adaptations, concept of sustainability  
 CO3. learn the practical application of research methodologies in ecology with reference to community studies

CO4. evaluate sustainable management related to local and global issues CO5. get knowledge on the recent issues associated with the environment
<b>Semester- V</b>
<b>Subject and code: G507.5a Plant Ecology &amp; Sustainable Development</b>
<b>Course Outcomes:</b>
CO1: learn various types of ecosystems and its significance in biodiversity conservation CO2: understand ecological concepts like succession and plant adaptations CO3: learn the practical application of research methodologies in ecology with reference to community studies CO4: understand the concept of sustainability CO5: understand the limitations of available natural resources and the need to sustain them CO6: evaluate sustainable management related to local and global issues CO7: get knowledge on the recent issues associated with environment
<b>Subject and code: G507.5b Cyto Genetics &amp; Molecular Biology</b>
<b>Course Outcomes:</b>
CO1: understand the concept of chromosomal organization, biomolecules (protein and nucleic acid) CO2: acquire knowledge of the genes inhabiting the cellular world of life that are engaged in metabolic processes. CO3: understand the concepts of cell division and cell cycles . CO4: gain knowledge on principles of genetics CO5: to understand the natural genetic variation in plants and to know how diverse factors contribute to the expression of genotypic and phenotypic variation. CO6: understand the effect of different types of mutation on genotypic and phenotypic expression CO7: understand the concept of plant sex determination and gene mutation CO8: to widen the knowledge on the role of polyploidy in plant breeding which could be employed in diverse fields of basic and applied research.
<b>Subject and code: Practical G507.5P</b>
<b>Course Outcomes:</b>
CO1: learn various types of ecosystems and its significance in biodiversity conservation CO2: understand ecological concepts like succession and plant adaptations CO3: understand the concepts of cell division and cell cycles . CO4: gain knowledge on principles of genetics
<b>Semester- VI</b>
<b>Subject and code: G507.6a Plant Physiology</b>
<b>Course Outcomes:</b>
CO1: learn the underlying principles of various physiological processes like Ascent of sap,

transpiration, photosynthesis, translocation and respiration in plants  
 CO2: understand the mechanism involved in these physiological processes  
 CO3: know the various plant growth substances and their physiological effects  
 CO4: understand the role of mineral nutrients in plants  
 CO5: understand the concepts like vernalization and photoperiodism, and their practical applications in agriculture  
 CO6: acquire the information on plant signalling and communication in plants

**Subject and code: G507.6b Plant Biotechnology, Phytochemistry and Pharmacognosy**

**Course Outcomes:**

CO1: learn the concepts and fundamental aspects pertaining to plant biotechnology, phytochemistry, pharmacognosy  
 CO2: understand the concept of genetically modified plants and their relevance to economy  
 CO3: know the principle involved in cultivation of medicinal plants by organic farming, plant tissue culture and to realize the eco friendly potential application of biotechnological processes in pharmaceuticals ,food industry, agriculture and its role in bioremediation.  
 CO4: enhance their analytical skills in research and know the lab safety measures.  
 CO5: acquire knowledge with regard to commercializing the primary and secondary metabolites as natural medicinal drugs.

**Subject and code: Practical G507.6P**

**Course Outcomes:**

CO1: learn the underlying principles of various physiological processes like Ascent of sap, transpiration, photosynthesis, translocation and respiration in plants  
 CO2: understand the mechanism involved in these physiological processes  
 CO3: enhance their analytical skills in research and know the lab safety measures.  
 CO5: acquire knowledge with regard to commercializing the primary and secondary metabolites as natural medicinal drugs.

**Department Name:**

**G 500B E B.Sc. BIOTECHNOLOGY**

**PROGRAMME OUTCOMES**

PO 1. Understand concepts of Biotechnology and demonstrate interdisciplinary skills acquired in cell biology, genetics, biochemistry, microbiology, and molecular biology.  
 PO 2. Apply the knowledge and skills gained in the fields of plant biotechnology, animal

biotechnology and microbial technology in pharma, food, agriculture, beverages, herbal and nutraceutical industries.

PO 3. Critically analyze environmental issues and apply the biotechnology knowledge gained for conserving the environment and resolving environmental problems.

PO 4. Demonstrate comprehensive innovations and skills in the fields of biomolecules, molecular biology, enzyme technology, bioprocess engineering and genetic engineering of plants, microbes, and animals with respect to applications for human welfare.

PO 5. Apply the knowledge and skills of immunology, bioinformatics, computational modelling of proteins, drug design and simulations to test models and aid in drug discovery.

PO 6. Critically analyze, interpret data, and apply tools of bioinformatics and multi-omics in various sectors of biotechnology including health and food.

PO 7. Demonstrate communication skills, scientific writing, data collection and interpretation abilities in all the fields of biotechnology.

PO 8. Learn and practice professional skills in handling microbes, animals and plants and demonstrate the ability to identify ethical issues related to recombinant DNA technology, genetic engineering, animals handling, intellectual property rights, biosafety, and biohazards.

PO 9. Explore the biotechnological practices and demonstrate innovative thinking in addressing the current day and future challenges with respect to food, health, and environment.

PO 10. Demonstrate thorough knowledge and application of good laboratory and good manufacturing practices in biotech industries.

PO 11. Apply the molecular biology principles and techniques in forensic and clinical biotechnology.

PO 12. Demonstrate entrepreneurship abilities, innovative thinking, planning, and setting up of small-scale enterprises or CROs.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO.1 Graduates in biotechnology will be eligible for pursuing higher education, M.Sc. programmes in the different field of life science.

PSO.2 Graduates will exhibit contemporary knowledge in Biotechnology and students will be eligible for doing jobs in pharmaceutical and biotechnological Industry.

PSO.3 Graduates will be able to understand the potentials, and impact of biotechnological innovations on environment and their implementation for finding sustainable solution to issues pertaining to environment, health sector, agriculture, etc.

PSO.4 Graduates will be able to design, conduct experiments, analyze and interpret data for investigating problems in Biotechnology and allied fields.

PSO.5 Graduates will be able to work individually as well as in team to survive in multidisciplinary environment.

PSO.6 Students are able to learn the modern molecular biological techniques viz, chromatography, SDS-PAGE, Agarose Gel Electrophoresis, fermentation, downstream processing and PCR which are very much required for the large-scale production of biotechnology derived products.

### **Semester- I**

**Subject and code: CELL BIOLOGY AND GENETICS  
G 511 DC1.1**

#### **Course Outcomes:**

- CO 1. Acquire a deep insight on the concepts of cell biology and genetics.  
CO 2. Describe the ultrastructure of cells, structure and function of organelles, cytosol and cytoskeleton  
CO 3. Illustrate the phases of cell cycle, cell division, reductional division in gametes, molecular mechanisms that regulate life and death of a cell including programmed cell death or apoptosis and differentiation in plants  
CO 4. Comprehend the organization and structure of chromosomes, banding techniques and Mendelian laws of inheritance, deviations, and exceptions to these laws.  
CO 5. Describe mutations and its types, genetic or hereditary disorders.

**Subject and code: CELL BIOLOGY AND GENETICS PRACTICAL  
G 511 DC2.1P**

#### **Course Outcomes:**

- CO 1. Interpret the different stages of cell division and to calculate the mitotic index.  
CO.2. Measure the size of cells and to count the number of cells using haemocytometer.  
CO 3. Demonstrate the handling of *Drosophila melanogaster*, the model organism for genetic studies.  
CO 4. Describe the principles and procedures of genetic techniques in biological experiments.

CO 5. Perform the perform the karyotyping analysis and solve various genetics Problems
<b>Subject and code: BIOTECHNOLOGY FOR HUMAN WELFARE G 511 OE 1.1</b>
<b>Course Outcomes:</b>
CO 1. Apply the biotechnological concepts in the industry CO 2. Implement the biotechnological techniques in environmental management CO 3. Describe application of biotechnology to forensic science CO 4. Comprehend contributions of biotechnology to biomedical fields, such as diagnostics, genomics and therapeutics
<b>Subject and code: BIOTECHNOLOGICAL SKILLS AND ANALYTICAL TECHNIQUES G 511 OE 1.1</b>
<b>Course Outcomes:</b>
CO 1. Apply the biotechnological concepts in the industry CO 2. Implement the biotechnological techniques in environmental management CO 3. Describe application of biotechnology to forensic science CO 4. Comprehend contributions of biotechnology to biomedical fields, such as diagnostics, genomics and therapeutics
<b>Subject and code: BIOTECHNOLOGY FOR HUMAN WELFARE Skill Enhancement Course</b>
<b>Course Outcomes:</b>
CO 1. Skill enhancement as per National Occupational Standards (NOS) of “Lab Technician/ Assistant” Qualification Pack issued by Life Sciences Sector Skill Development Council – LFS/Q0509, Level 3. CO 2. Knowledge about major activities of biotech industry, regulations, and compliance, environment, health, and safety (EHS), good laboratory practices (GLP), standard operating procedures (SOP) and GMP as per the industry standards. CO 3. Soft skills, such as decision making, planning, organizing, problem solving, analytical thinking, critical thinking, and documentation.
<b>Semester- II</b>
<b>Subject and code: MICROBIOLOGICAL METHODS AND TECHNIQUES G 511DC1.2</b>
<b>Course Outcomes:</b>
CO 1. Comprehend the importance and methods of sterilization in microbiological work CO 2. Delineate the formulation of media, culture methods and staining techniques for

isolation, characterization of microbes
CO 3. Apply the knowledge of antimicrobial agents in anti- microbial assays.
<b>Subject and code: Microbiological methods and techniques Practical G 511 DC 2.2P</b>
<b>Course Outcomes:</b>
CO 1. Handle and use instruments used in Microbiology and Biotechnology laboratories
CO 2. Use analytical techniques for work using microorganisms
CO 3. Experiment with various methods of sterilization in microbiological work
CO 4. Prepare different types of media, perform culture methods and staining techniques for isolation, characterization of microbes
CO 5. Handle and use antimicrobial agents and perform anti-microbial assays
<b>Subject and code APPLICATIONS OF BIOTECHNOLOGY IN AGRICULTURE G 511 OE1.2</b>
<b>Course Outcomes:</b>
CO 1. Employ the biotechnological approaches in agriculture
CO 2. Apply biotechnological methods in plant tissue culture
CO 3. Comprehend the pros and cons of GM crops and their plant products
<b>Semester- III</b>
<b>Subject and code: Biomolecules G511 DC1.3</b>
<b>Course Outcomes:</b>
CO 1. Cognise the properties of carbohydrates, proteins, lipids, cholesterol, DNA, RNA, glycoproteins and glycolipids and their importance in biological systems.
CO 2. Apprehend the importance of high energy compounds, electron transport chain, synthesis of ATP under aerobic and anaerobic conditions.
CO 3. Interpret the metabolic pathways such as Glycolysis, Krebs's Cycle, ETC, pentose phosphate pathway, etc. occurring inside living cells.
CO 4. Translate the importance of biological macromolecules and their role in living Systems
<b>Subject and code : Biomolecules Practical G511 DC 2.3P</b>

<b>Course Outcomes:</b>
CO 1. Exposure to basic reactions of biomolecules. CO 2. Determine presence of biomolecules like carbohydrates, proteins, lipids, etc. in known and unknown samples. CO 3. Determine the extent of adulteration in samples containing biomolecules CO 4. Construct the standard curve, analyse the data and interpret the results. CO 5. Apply knowledge of biochemistry and metabolism in various cellular functions, and the application of research involved in various biochemical processes.
<b>Subject and code: : IPR, Biosafety &amp; Bioethics in Biotechnology G511 OE1.3</b>
<b>Course Outcomes:</b>
CO.1 Know the importance of bioethics, biosafety and IPR CO.2 Elucidate different types of intellectual property rights in general and protection of products derived from biotechnology research CO.3 Follow environment, health and safety (EHS),GMP and GLP norms at work in the life sciences facility/ laboratory CO. 4 Evaluate multiple perspectives concerning bioethical issues and recognize that different value systems may lead to different ethical decisions. CO.5 Follow the regulatory framework in their future venture to ensure product safety and benefit the society
<b>Semester- IV</b>
<b>Subject and code: Molecular Biology G 511 DC1.4</b>
<b>Course Outcomes:</b>
CO 1. Acquire a deep insight on the concepts of central dogma in Molecular biology. CO 2. Describe the fine structure of DNA and the mechanism of replication in prokaryotes and eukaryotes. CO 3. Comprehend the causes of DNA damage and various mechanism of DNA repair. CO 4. Illustrate the fundamental principles of gene expression and regulation in cells CO 5. Select appropriate model systems for studying different molecular biological processes
<b>Subject and code: Molecular Biology Practical G 511 DC 2.4 P</b>
<b>Course Outcomes:</b>
CO 1. Independently execute laboratory experiments using the standard methods and techniques in molecular biology, with the appropriate analysis and interpretation of results obtained. CO 2. Independently use various instruments such as centrifuges, colorimeters, UV-transilluminator, Gel Doc, UV- Vis spectrophotometer in laboratory work.

<b>Semester- V</b>
<b>Subject and code: G 511.5a (Theory) – Plant Biotechnology</b>
<b>Course Outcomes:</b>
CO1: This course will provide the students knowledge about different techniques of plant biotechnology utilized for conservation and mass propagation of rare and endangered plant species.
CO2: The course will enlighten student about principles of plant tissue culture including <i>in vitro</i> culture of different plant parts.
CO3: The course will provide detail pertaining to tools and processes involved in generation of transgenic plants.
CO4:It will explain the production of haploid plants, Hybrids, Virus free plants and selection of variants
CO5: It will teach Germplasm conservation and various methods involved
<b>Subject and code: G 511.5b (Theory) – Animal Biotechnology</b>
<b>Course Outcomes:</b>
CO1: To understand principles of animal culture, media preparation
CO2: To explain Invitro fertilization and embryo transfer technology.
CO3: The course will describe as to how animal cell culture is carried out for research and diagnostic purposes.
CO4: The techniques involved in cloning
CO5: The course will describe gene therapy and its applications
CO6: How transgenic animals are generated, what are the pros and cons along with ethical issues associated with transgenesis.
<b>Subject and code: G 511.5P (Practical) –Plant Biotechnology and Animal Biotechnology</b>
<b>Course Outcomes:</b>
CO1: To understand principles of animal culture, media preparation
CO2: To explain Invitro fertilization and embryo transfer technology
CO3: The course will provide detail pertaining to tools and processes involved in generation of transgenic plants.
CO4:It will explain the production of haploid plants, Hybrids, Virus free plants and selection of variants
<b>Semester- VI</b>
<b>Subject and code: G 511.6a (Theory) Environmental Biotechnology</b>
<b>Course Outcomes:</b>
CO1: Learning outcome of Environment Biotechnology is to describe existing and emerging technologies that are important in the area of environment and the principles and techniques

which underline the application of biosciences, address environmental issues including pollution, Environment Protection laws, biogeochemical cycle, mineral resource, renewable energy and water recycling.

CO2: Course will have a specific focus on bioremediation and treatment of polluted effluent.

CO3: The course will also provide conceptual knowledge on water analysis, solid and liquid waste management

CO4: To explain the microbial degradation of pesticides, Bioremediation & Biofertilizers.

Course will have a specific focus on biofuels and energy gardens.

**Subject and code: G 511.6b (Theory) –Bioprocess Technology**

**Course Outcomes:**

CO1: The role of a bioprocess engineer in chemical, pharmaceutical and distillation industry.

CO2: The integrated bioprocess, design reactors, maintain contamination free environment in bioprocesses.

CO3: To develop concepts to scale-up bioprocesses for industry as well as research organizations.

CO4: Develop skills associated with screening of Industrially Important Strains.

CO5: Understand principles underlying design of Fermentor and Fermentation Process.

**Subject and code: G511.6Pa (Practical) Environment Biotechnology & Bioprocess technology**

**Course Outcomes:**

CO1: The role of a bioprocess engineer in chemical, pharmaceutical and distillation industry.

CO2: The integrated bioprocess, design reactors, maintain contamination free environment in bioprocesses.

CO3: The course will also provide conceptual knowledge on water analysis, solid and liquid waste management

**Department  
Name:**

**G 500B I B.Sc.  
MICROBIOLOGY**

**PROGRAMME OUTCOMES**

PO 1.Disciplinary Knowledge: Bachelor degree in Food Technology helps to apply the knowledge of science, engineering fundamentals, and mathematical concepts to the solution in the field of food technology, science and other allied subjects

PO 2.Communication Skills: Communicate effectively and write effective reports and design documentation, make effective presentations through seminars, project dissertations

PO 3.Critical thinking and analytical reasoning: Recognize the need for, and have the preparation and ability to engage in independent/as an entrepreneur and life-long learning in the broadest context of technological change logical reasoning and capability of recognizing and distinguishing the various aspects of real-life problems.

PO 4.Problem Solving: Identify, formulate, review research literature, and analyze complex Food Technology/applications problems and Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the food sustainability

PO 5.Research related skills: Acquire the practical knowledge and demonstrate the ability to design, conduct/trouble shoot experiments and analyze data in the field of food technology

PO 6.Information/digital Literacy: The completion of this programme will enable the learner to use appropriate software's to apply for bulk scale/industrial production of technology-based food products

PO 7.Self-directed learning: The student completing this program will develop an ability of working independently and to make an in-depth study of various disciplines of food technology.

PO 8.Moral and ethical awareness/reasoning: Under stand the impact to f the professional food technology solutions in societal and environmental contexts, and apply ethical principles and commit to professional ethics and responsibilities

PO 9.Lifelong learning: This programme provides self-directed learning and lifelong learning skills to think independently and develop problem solving skills with respect to food industry

PO 10. Ability to peruse advanced studies and research in Allied fields of Food science.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO.1. Know the chemistry underlying the properties and reactions of various food components, have sufficient knowledge of food chemistry to control reactions in foods, know the major chemical reactions that limit shelf life of foods, use the laboratory techniques common to basic and applied food chemistry and know the principles behind analytical techniques associated with food.

PSO.2. Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they will grow, inactivated, killed or made harmless in foods and know the principles involving food preservation via fermentation processes.

PSO.3. Incorporate the principles of food science and nutrition in practical, real- world situations and problems.

PSO.4. Apply the principles of food science to control and assure the quality of food products and also identify government regulations required for the manufacture and sale of food products.

PSO.5. List major properties, functions, and important food sources of the nutrients, describe human nutrient and energy needs throughout the life span and in physical training and translate human nutrient and energy needs into daily food selection utilizing appropriate standards and guidelines.

PSO.6. Explain the significance of food practices to nutrition and disease prevention and effectively evaluate meal plans for nutritional adequacy, nutrient density, balance, variety, and calorie control.

<b>Semester- I</b>
<b>Subject and code: G 509 DC1.1 General Microbiology</b>
<b>Course Outcomes:</b>
<p>CO 1. Have developed a good knowledge of the development of the discipline of Microbiology and the contributions made by prominent scientists in this field.</p> <p>CO2. Have developed a very good understanding of the characteristics of Different types of microorganisms, methods to organize/classify these into and basic tools to study these in the laboratory.</p> <p>CO3. Describe the nutritional requirements of bacteria for growth; developed knowledge and understanding that besides common bacteria there are several other microbes which grow under extreme environments.</p> <p>CO4. Perform basic laboratory experiments to study microorganisms; methods to preserve bacteria in the laboratory; calculate generation time of growing bacteria.</p> <p>CO5. Are able to perform basic experiments to grow and study microorganisms in the laboratory.</p>
<b>Subject and code: Practical: : G 509 DC1.1P .General Microbiology</b>
<b>Course Outcomes:</b>
<p>CO 1. Have developed a good knowledge of the development of the discipline of Microbiology and the contributions made by prominent scientists in this field.</p> <p>CO2. Have developed a very good understanding of the characteristics of Different types of microorganisms, methods to organize/classify these into and basic tools to study these in the laboratory.</p> <p>CO3. Describe the nutritional requirements of bacteria for growth; developed knowledge and understanding that besides common bacteria there are several other microbes which grow under extreme environments.</p> <p>CO4. Perform basic laboratory experiments to study microorganisms; methods to preserve bacteria in the laboratory; calculate generation time of growing bacteria.</p> <p>CO5. Are able to perform basic experiments to grow and study microorganisms in the laboratory.</p>
<b>Subject and code : G 509 OE1.1 Microorganisms for Human Welfare</b>
<b>Course Outcomes:</b>
<p>CO1: Acquire the knowledge of importance of microbes in human welfare.</p> <p>CO2: Acquire the knowledge of importance of microbes in agriculture.</p> <p>CO3: Acquire the knowledge of importance of microbes in pharmacy.</p>
<b>Semester- II</b>
<b>Subject and code: G 509 DC1.2 Microbial Biochemistry and Physiology</b>
<b>Course Outcomes:</b>
<p>CO1. Have developed a good knowledge of biochemical concepts with regard to the chemical bonds in biological compounds.</p> <p>CO2. Have developed a very good understanding of the characteristics of Structure and</p>

properties of Water as an universal solvent, polarity, hydrophilic and hydrophobic interactions, properties of water, Acids, bases, electrolytes, hydrogen ion concentration, pH, buffers.

CO3. Describe the definition, classification, structure and properties of carbohydrates and amino acids and proteins, lipids; fatty acids: types and classification, Vitamins

CO4. Have an understanding the principles of bioenergetics and role of respiration in synthesis of energy molecules.

CO5. Perform biochemical tests with application of biochemical principles..

**Subject and code : Practicals: G 509 DC2.2 P Microbial Biochemistry and Physiology**

**Course Outcomes:**

CO1. Have developed a good knowledge of biochemical concepts with regard to the chemical bonds in biological compounds.

CO2. Have developed a very good understanding of the characteristics of Structure and properties of Water as an universal solvent, polarity, hydrophilic and hydrophobic interactions, properties of water, Acids, bases, electrolytes, hydrogen ion concentration, pH, buffers.

CO3. Describe the definition, classification, structure and properties of carbohydrates and amino acids and proteins, lipids; fatty acids: types and classification, Vitamins

CO4. Have an understanding the principles of bioenergetics and role of respiration in synthesis of energy molecules.

CO5. Perform biochemical tests with application of biochemical principles..

**Subject and code: G 509 OE1.2 BACTERIOLOGY**

**Course Outcomes:**

CO1: Acquire the knowledge of bacteria.

CO2: Acquire the knowledge of control of microorganisms.

CO3: Acquire the knowledge of nutrition of microbes.

**Semester- III**

**Subject and code: Microbial Diversity--G509 DC3.1**

**Course Outcomes:**

CO1: Knowledge about microbes and their diversity

CO2. Study, characters, classification and economic importance of Pro-eukaryotic and Eukaryotic microbes.

CO3. Knowledge about viruses and their diversity

**Subject and code: Microbial Diversity Practical –G509.3DC3.1P**

**Course Outcomes:**

CO 1. Knowledge about microbes and their diversity

CO2. Study, characters, classification and economic importance of Pro-eukaryotic and Eukaryotic microbes.
CO3. Knowledge about viruses and their diversity
<b>Subject and code: G509.3OE Virology</b>
<b>Course Outcomes:</b>
CO1: Knowlegde of viruses.
CO2. Understanding the replication mechanisms of viruses.
<b>Semester- IV</b>
<b>Subject and code: Microbial Enzymology and Metabolism- G509.4DC1.1</b>
<b>Course Outcomes:</b>
CO1: Understand the enzymes and their role in metabolism.
CO2. Understand the fermentation pathways and their importance.
CO3. Describing the growth characteristics of the microorganisms which require different nutrient for growth and the associated mechanisms of energy generation for their survival like autotrophs, heterotrophs, chemolithotrophs.
CO4. Describe the metabolic pathway of photosynthesis as an energy yielding metabolic pathway in bacteria.
CO5. Describe the biogeochemical cycles and mineral transformation by microbes.
.
<b>Subject and code : Microbial Enzymology and Metabolism – G509. 4DC4.1P</b>
<b>Course Outcomes:</b>
CO1: Understand the enzymes and their role in metabolism.
CO2. Understand the fermentation pathways and their importance.
CO3. Describing the growth characteristics of the microorganisms which require different nutrient for growth and the associated mechanisms of energy generation for their survival like autotrophs, heterotrophs, chemolithotrophs.
CO4. Describe the metabolic pathway of photosynthesis as an energy yielding metabolic pathway in bacteria.
CO5. Describe the biogeochemical cycles and mineral transformation by microbes.
<b>Subject and code : Environmental and Sanitary Microbiology Course 2 : G509.4OE</b>
<b>Course Outcomes:</b>
CO 1. Acquire the knowledge of microbes in environment.
CO2: Acquire the knowledge of water borne infections.
CO3: Understand the importance of the role of microbes in public health.

Semester- V
<b>Subject and code : G509.5a Medical Microbiology and Immunology.</b>
<b>Course Outcomes:</b>
<p>CO 1. understand the basic concepts of immunology and types of immune system.</p> <p><b>CO2..</b> Understood the basic and general concepts of causation of disease by the pathogenic microorganisms and the various parameters of assessment of their severity including the broad categorization of the methods of diagnosis.</p> <p><b>CO3.</b> Developed a thorough understanding of common bacterial, viral, fungal, parasitic diseases of human being including some very important diseases of the animals also.</p> <p><b>CO4.</b> Conceptualized the protective role of the immune system of the host and developed an understanding of the basic components as well as the mechanisms underlying the immune system and its response to pathogenic microorganisms.</p> <p><b>CO5.</b> Are able to conduct experiments for growing common bacteria in different microbiological media, antibiotic sensitivity determination and antigen antibody reaction (precipitation test in the agarose)</p>
<b>Subject and code : G509.5P Medical Microbiology and Immunology</b>
<b>Subject and code : Practical</b>
<b>Course Outcomes:</b>
<p>CO 1. understand the basic concepts of immunology and types of immune system.</p> <p><b>CO2..</b> Understood the basic and general concepts of causation of disease by the pathogenic microorganisms and the various parameters of assessment of their severity including the broad categorization of the methods of diagnosis.</p> <p><b>CO3.</b> Are able to identify the role of microorganisms in the causation of the diseases in plants.</p> <p><b>CO4.</b> Understand the role of microorganisms in biodegradation of organic pollutants and natural compounds.</p> <p><b>CO5.</b> Develop a clear understanding of composting the organic waste and role of microbes in composting.</p>
<b>Subject and code : Plant Microbiology and Bioremediation</b>
<b>Paper-G509.5b</b>
<b>Course Outcomes:</b>
<p>CO1 Developed a clear understanding of the multifarious roles of microorganisms in soil, in association with plants.</p> <p>CO2. Are able to describe the role of microorganisms in the production of plant diseases and biological control.</p> <p>CO3. Are able to identify the role of microorganisms in the causation of the diseases in plants.</p> <p>CO4. Understand the role of microorganisms in biodegradation of organic pollutants and</p>

natural compounds.

CO5. Develop a clear understanding of composting the organic waste and role of microbes in composting.

### **Semester- VI**

**Subject and code : Principles of Bacterial Genetics, Genetic Engineering and Bioinformatics Paper-G509.6a**

#### **Course Outcomes:**

CO1: Has acquired knowledge of gene, their expression and regulation of expression. Has acquired a fairly good understanding mechanisms of genetic exchange, mutations and their implications.

**CO2.** Has developed practical skill for isolation of bacteria/plasmid DNA

**CO3.** Has acquired a fairly good knowledge of the tools and the methods for genetic engineering.

**CO4.** Developed skills to use computers for analysis of biological data.

**CO5.** Skill to use important biological databases, use tools to retrieve data, and compare the data of the biological macromolecules. Developed basic skills for data retrieval, representation, analysis and interpretation

**Subject and code: Practical G509P**

#### **Course Outcomes:**

CO1: Has acquired knowledge of gene, their expression and regulation of expression. Has acquired a fairly good understanding mechanisms of genetic exchange, mutations and their implications.

**CO2.** Has developed practical skill for isolation of bacteria/plasmid DNA

**CO3.** Has acquired knowledge of spoilage of selective foods and their preservation

**CO4.** Has acquired knowledge of fermentation types and production of organic acids, alcohols, enzymes, antibiotics and various foods in the industry.

**Subject and code: Applied Microbiology-G509.6b**

#### **Course Outcomes:**

**CO1:** Has acquired a fairly good knowledge of microbes in food and their role in food spoilage.

**CO2.** Has acquired knowledge of various methods of food preservation.

**CO3.** Has acquired knowledge of spoilage of selective foods and their preservation

**CO4.** Has acquired knowledge of fermentation types and production of organic acids, alcohols, enzymes, antibiotics and various foods in the industry.

**CO5.** Has acquired knowledge of how microbes are involved in milk spoilage and milk preservation.

**Department**

**G 500B L B.Sc.**

<b>Name:</b>	<b>FOOD SCIENCE</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO 1.Disciplinatory Knowledge: Bachelor degree in Food Technology helps to apply the knowledge of science, engineering fundamentals, and mathematical concepts to the solution in the field offoodtechnology, scienceand other allied subjects</p> <p>PO 2.Communication Skills: Communicate effectively and write effective reports and design documentation, make effective presentations through seminars, project dissertations</p> <p>PO 3.Critical thinking and analytical reasoning: Recognize the need for, and have the preparation and ability to engage in independent/as an entrepreneur and life-long learning in the broadest context of technological change logical reasoning and capability of recognizing and distinguishing the various aspects of real-life problems.</p> <p>PO 4.Problem Solving: Identify, formulate, review research literature, and analyze complex Food Technology/applications problems and Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the food sustainability</p> <p>PO 5.Research related skills: Acquire the practical knowledge and demonstrate the ability to design, conduct/trouble shoot experiments and analyze data in the field of food technology</p> <p>PO 6.Information/digital Literacy: The completion of this programme will enable the learner to use appropriate software's to apply for bulk scale/industrial production of technology-based food products</p> <p>PO 7.Self-directedlearning: The student completing this program will develop anability of working independently and to make an in-depth study of various disciplines of food technology.</p> <p>PO 8.Moral and ethical awareness/reasoning: Under stand the impact to f the professional food technology solutions in societal and environmental contexts, and apply ethical principles and commit to professional ethics and responsibilities</p> <p>PO 9.Lifelong learning: This programme provides self-directed learning and lifelong learning skills to think independently and develop problem solving skills with respect to food industry</p> <p>PO 10. Ability to peruse advanced studies and research in Allied fields of Food science.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO.1. Know the chemistry underlying the properties and reactions of various food components, have sufficient knowledge of food chemistry to control reactions in foods, know the major chemical reactions that limit shelf life of foods, use the laboratory techniques common to basic and applied food chemistry and know the principles behind analytical techniques associated with food.</p>	

PSO.2. Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they will grow, inactivated, killed or made harmless in foods and know the principles involving food preservation via fermentation processes.

PSO.3. Incorporate the principles of food science and nutrition in practical, real- world situations and problems.

PSO.4. Apply the principles of food science to control and assure the quality of food products and also identify government regulations required for the manufacture and sale of food products.

PSO.5. List major properties, functions, and important food sources of the nutrients, describe human nutrient and energy needs throughout the life span and in physical training and translate human nutrient and energy needs into daily food selection utilizing appropriate standards and guidelines.

PSO.6. Explain the significance of food practices to nutrition and disease prevention and effectively evaluate meal plans for nutritional adequacy, nutrient density, balance, variety, and calorie control..

### Semester- I

**Subject and code: Fundamentals of Food Science & Nutrition  
G 514 DC1.1**

#### Course Outcomes:

CO 1. Obtain knowledge of different food groups, their composition and role in diet.  
CO 2. To gain knowledge of different plant and animal derived foods and their nutritive values and properties.  
CO 3. Different methods of processing and cooking.  
CO 4. Critically assess and analyze food science information available in the public domain in an innovative and ethical way.

**Subject and code : Fundamentals of Food Science & Nutrition  
Practical– 1  
G 514 DC2.1P**

#### Course Outcomes:

CO 1. Obtain knowledge of different food groups, their composition and role in diet.  
CO 2. To gain knowledge of different plant and animal derived foods and their nutritive values and properties.  
CO 3. Different methods of processing and cooking.  
CO 4. Critically assess and analyze food science information available in the public domain in an innovative and ethical way.

Semester- II
<b>Subject and code: Food Processing And Preservation</b> <b>G 514 DC1.2</b>
<b>Course Outcomes:</b>
CO 1. Describes the principles of food preservation and suggest the application of the preservation process depending on the type of food. CO 2. Determines the thermal processing conditions (time / temperature) for each type of food and propose a device that matches a particular conservation process. CO 3. Chooses the appropriate application of certain conservation processes with regard to the preservation of quality and the satisfactory durability of food products. CO 4. Optimizes process parameters for selected conservation processes taking into account the physico-chemical properties of food products.
<b>G 509 DC2.2 P</b>
<b>Subject and code : Food Processing And Preservation Practical</b> <b>G 514 DC1.2P</b>
<b>Course Outcomes:</b>
CO 1. Describes the principles of food preservation and suggest the application of the preservation process depending on the type of food. CO 2. Determines the thermal processing conditions (time / temperature) for each type of food and propose a device that matches a particular conservation process. CO 3. Chooses the appropriate application of certain conservation processes with regard to the preservation of quality and the satisfactory durability of food products. CO 4. Optimizes process parameters for selected conservation processes taking into account the physico-chemical properties of food products.
Semester- III
<b>Subject and code: Basics of Food Safety and Quality Control</b> <b>G514 DC1.3</b>
<b>Course Outcomes:</b>
CO 1. Analyse and understand the export quality control procedures.CO 2.Provide frame work on the concepts of Quality Control Activities CO 3. Learn about the applications of safety management in food industry. CO 4. Define different food laws and regulations for quality management in food industry.CO 4. Detect the adulteration in food samples CO 5. Review of legislative approaches for the management of food safety
<b>Subject and code: Basics of Food Safety and Quality Control</b> <b>G509 DC2.3P</b>
<b>Course Outcomes:</b>
CO 1. Analyse and understand the export quality control procedures.CO 2.Provide frame

work on the concepts of Quality Control Activities CO 3. Learn about the applications of safety management in food industry. CO 4. Define different food laws and regulations for quality management in food industry.CO 4. Detect the adulteration in food samples CO 5. Review of legislative approaches for the management of food safety
<b>Semester- IV</b>
<b>Subject and code: Fundamentals of food chemistry and microbiology G 514 DC1.4</b>
<b>Course Outcomes:</b>
CO 1. Students will have a thorough understanding of structure and classification various Components of food.. CO 2. The students will know the process of complete digestion and assimilation of food Component. CO 3. Students will have a thorough understanding of various factors responsible for food Spoilage. CO 4. Define and have an overview on food chemistry including composition and the importance of water.
<b>Subject and code : Fundamentals of food chemistry and microbiology Practical G 514 DC2.4P</b>
<b>Course Outcomes:</b>
CO 1. Students will have a thorough understanding of structure and classification various Components of food.. CO 2. The students will know the process of complete digestion and assimilation of food Component. CO 3. Students will have a thorough understanding of various factors responsible for food Spoilage. CO 4. Define and have an overview on food chemistry including composition and the importance of water.

<b>Department Name:</b>	<b>G 600 B C A</b>
<b>PROGRAMME OUTCOMES</b>	
PO1: Understand, Analyze and Develop computer programs in the areas related to	

Object-oriented concepts, Web designing and Algorithms.
PO2: Develops the necessary skills to make a career in the field of computers.
PO3: Inculcate various software development practices.
PO4: Develops the ability to select modern computing tools, skills and technique necessary for innovative software solutions.
PO5: Developing ability to identify, analyze the complex computing problem using fundamentals of computer science and application domain.
PO6: Building ability to work as a member or leader of a team in multidisciplinary environment.
<b>PROGRAMME SPECIFIC OUTCOMES</b>
PSO1: Producing knowledgeable and skilled human resources to be employable in IT Industry.
PSO2: Exploring the skills of students to become entrepreneurs who can develop customized solutions for small and medium enterprises.
PSO3: Giving skills and information not only about computer and information technology but also about organization and management.
<b>Semester- I</b>
<b>Subject and code : Fundamentals of Computers</b>
Course Code: <b>G 601 DC 1.1</b>
<b>Course Outcomes:</b>
CO1: Understand the fundamentals of computer system
CO2: Identify different components within the computer system
CO3: Understand different types of input and output devices
CO4: Demonstrate the working concepts of different devices connected to computer
CO5: Explain different generations of programming languages and their significance
CO6: Understand the use of Word processing, Spreadsheet, Presentation and DBMS applications
CO7: Understand Digital computer and digital systems functioning
<b>Subject and code: Programming in C</b>
<b>G 601 DC 2.1</b>

<b>Course Outcomes:</b>
CO1 Read, understand and trace the execution of programs written in C language CO2: Write the C code for a given problem CO3: Perform input and output operations using programs in C CO4: Write programs that perform operations on arrays
<b>Subject and code: C Programming Lab</b> <b>Course Code: G 601 DC 2.1P</b>
<b>Course Outcomes:</b>
CO1 Read, understand and trace the execution of programs written in C language CO2: Write the C code for a given problem CO3: Perform input and output operations using programs in C CO4: Write programs that perform operations on arrays
<b>Subject and code: Mathematical Foundation</b> <b>Course Code: G 601 DC 3.1</b>
<b>Course Outcomes:</b>
CO1: Study and solve problems related to connectives, predicates and quantifiers under different situations. CO2: Develop basic knowledge of matrices and to solve equations using Cramer's rule. CO3: Know the concept of Eigen values. CO4: To develop the knowledge about derivatives and know various applications of differentiation. CO5: Understand the basic concepts of Mathematical reasoning, set and functions
<b>Subject and code: Business Statistics</b> <b>Course Code: G 601 OE 1.1</b>
<b>Course Outcomes:</b>
CO1: Frame and formulate management decision problems. CO2: Understand the basic concepts underlying quantitative analysis. CO3: Use sound judgment in the applications of quantitative methods to management decisions.
<b>Subject and code: Office Automation</b>

<b>Course Code: G 601 OE 2.1</b>
<b>Course Outcomes:</b>
CO1: Compare and contrast various types of operating systems CO2: Explain the purpose of office automation CO3: Describe how information is stored and retrieved in/from computer memory CO4: Know about various types of office automation software and their applications CO5: Create document using word processing software CO6: Design presentation using presentation software CO7: Create worksheets using spreadsheet software CO8: Store and retrieve data in/from database management application
<b>Semester- II</b>
<b>Subject and code: Data Structures using C</b>
<b>Course Code: G 601 DC 1.2</b>
<b>Course Outcomes:</b>
CO1: Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms CO2: Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs CO3: Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs CO4: Demonstrate different methods for traversing trees CO5: Compare alternative implementations of data structures with respect to performance CO6: Describe the concept of recursion, give examples of its use CO7: Discuss the computational efficiency of the principal algorithms for sorting and searching
<b>Subject and code: Data Structures Lab</b>
<b>Course Code: G 601 DC 1.2P</b>
<b>Course Outcomes:</b>
CO1: Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are

represented in memory and used by algorithms

CO2: Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs

CO3: Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs

CO4: Demonstrate different methods for traversing trees

**Subject and code : Object Oriented Programming with JAVA**

**Course Code: G 601 DC 2.2**

**Course Outcomes:**

CO1: Understand the features of Java and the architecture of JVM

CO2: Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done

CO3: Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance

CO4: The students will be able to demonstrate programs based on interfaces and threads and explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Language

CO5: Write, compile, execute Java programs that include GUIs and event driven programming and also programs based on files

**Subject and code : Object Oriented Programming with JAVA LAB**

**Course Code: G 601 DC 2.2P**

**Course Outcomes:**

CO1: Understand the features of Java and the architecture of JVM

CO2: Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done

CO3: Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance

CO4: The students will be able to demonstrate programs based on interfaces and threads and explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Language

CO5: Write, compile, execute Java programs that include GUIs and event driven programming and also programs based on files

**Subject and code : Discrete Mathematical Structures**

<b>Course Code: G 601 DC 3.2</b>
<b>Course Outcomes:</b>
<p>CO1: To understand the basic concepts of Mathematical reasoning, set and functions.</p> <p>CO2: To understand various counting techniques.</p> <p>CO3: Understand the concepts of various types of relations, partial ordering and equivalence relations.</p> <p>CO4: To understand the concept of probability and mathematical induction.</p> <p>CO5: Familiarize the fundamental concepts of graph theory and shortest path algorithm.</p> <p>CO6 : To understand the concept of binary tree representation.</p>
<b>Subject and code: Applied Statistics</b> <b>Course Code: G 601 OE 1.2</b>
<b>Course Outcomes:</b>
<p>CO1: Understand the Price and Quantity Index numbers and their different measures, understand the applicability of cost-of-living Index number.</p> <p>CO2: Know the components and Need for Time series, understand the different methods of studying trend and Seasonal Index.</p> <p>CO3: Study the concept of vital statistics, sources of data, different measures of Fertility and Mortality, Understand the Growth rates- GRR and NRR and their interpretations.</p> <p>CO4: Know the concept of Population, Sample, Sampling unit, sampling design, sampling frame, sampling scheme, need for sampling, apply the different sampling methods for designing and selecting a sample from a population, explain sampling and non-sampling errors.</p> <p>CO5: Describe the philosophy of statistical quality control tools as well as their usefulness in industry and hence develop quality control tools in a given situation.CO8: Store and retrieve data in/from database management application</p>
<b>Subject and code: Web Designing</b> <b>Course Code: G 601 OE 2.2</b>
<b>Course Outcomes:</b>
<p>CO1: Compare and contrast various types of operating systems</p> <p>CO2: Explain the purpose of office automation</p> <p>CO3: Describe how information is stored and retrieved in/from computer memory</p> <p>CO4: Know about various types of office automation software and their applications</p>

CO5: Create document using word processing software
CO6: Design presentation using presentation software
CO7: Create worksheets using spreadsheet software
CO8: Store and retrieve data in/from database management application
<b>Semester- III</b>
<b>Subject and code:: Data Base Management Systems</b>
<b>Course Code: G 601 DC 1.3</b>
<b>Course Outcomes:</b>
CO1: To describe data models and schemas in DBMS CO2: To understand the features of database management systems and Relational database. CO3: To Demonstrate an understanding of the relational data model and use SQL. CO4: To understand the functional dependencies and use SQL solutions to a broad range of query and data update problems..
<b>Subject and code:: Data Base Management Systems Lab</b>
<b>Course Code: G 601 DC 1.3P</b>
<b>Course Outcomes:</b>
CO1: To describe data models and schemas in DBMS CO2: To understand the features of database management systems and Relational database. CO3: To Demonstrate an understanding of the relational data model and use SQL. CO4: To understand the functional dependencies and use SQL solutions to a broad range of query and data update problems..
<b>Subject and code: C# and DOT NET Framework</b>
<b>Course Code: G 601 DC 2.3</b>
<b>Course Outcomes:</b>
CO1: Learn to design, develop and execute basic programs in C#. CO2: Explore the basics of C# in more detail to create an application. CO3: Gain mastery over object-oriented programming (OOP) to write cleaner, more modular, and more scalable code.
<b>Subject and code: C# and DOT NET Framework Lab</b>

<b>Course Code: G 601 DC 2.3P</b>
<b>Course Outcomes:</b>
CO1: Learn to design, develop and execute basic programs in C#. CO2: Explore the basics of C# in more detail to create an application. CO3: Gain mastery over object-oriented programming (OOP) to write cleaner, more modular, and more scalable code.
<b>Subject and code: Operating System Concepts</b>
<b>Course Code: G 601 DC 3.3</b>
<b>Course Outcomes:</b>
CO1: At the end of the course students will be able to Analyze the structure of OS and basic architectural components involved in design CO2: Analyze the various resource management techniques conceptualize the components involved in designing a contemporary OS. CO3: Learn Windows Operating system basics
<b>Subject and code : COMPUTER ORIENTED NUMERICAL ANALYSIS</b>
<b>Course Code: G 601 OE 1.3</b>
<b>Course Outcomes:</b>
CO1: At the end of the course students will be able to solve an algebraic or transcendental equation using an appropriate numerical method. CO2: Solve a differential equation using an appropriate numerical method and Apply Numerical Concepts in Coding.
<b>Semester- IV</b>
<b>Subject and code: Python Programming</b>
<b>Course Code: G 601 DC1.4</b>
<b>Course Outcomes:</b>
CO1: Be skilled at creating, debugging and testing a software application using the Python programming language.
<b>Subject and code: Python Programming lab</b>
<b>Course Code: G 601 DC 1.4P</b>

<b>Course Outcomes:</b>
CO1 Be skilled at creating, debugging and testing a software application using the Python programming language.
<b>Subject and code: Computer Multimedia and Animation</b>
<b>Course Code: G 601 DC 2.4</b>
<b>Course Outcomes:</b>
CO1: able to draw primitive graphical shapes and perform transformation techniques programmatically.
CO2: learn about various new technologies developed and their applications.
<b>Subject and code: Computer Multimedia and Animation Lab</b>
<b>Course Code: G 601 DC 2.4P</b>
<b>Course Outcomes:</b>
CO1: able to draw primitive graphical shapes and perform transformation techniques programmatically.
CO2: learn about various new technologies developed and their applications.
<b>Subject and code: Computer Communication and Networks</b>
<b>Course Code: G 601 DC 3.4</b>
<b>Course Outcomes:</b>
CO1: able to draw primitive graphical shapes and perform transformation techniques programmatically.
CO2: learn about various new technologies developed and their applications.
<b>Semester- V</b>
<b>Subject and code: G 601.5: JAVA 2 ENTERPRISE EDITION</b>
<b>Course Outcomes:</b>
CO1: At the end of the course students will be able to Design/Develop Program
CO2: Develop appropriate data model and database scheme
CO3: Create and test prototypes
<b>Subject and code: G 602 .5: COMPUTER GRAPHICS AND MULTIMEDIA</b>
<b>Course Outcomes:</b>
CO1: To list the basic concepts used in computer graphics.

CO2: To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
<b>Subject and code: G 603.5: OBJECT ORIENTED ANALYSIS &amp; DESIGN</b>
<b>Course Outcomes:</b>
CO1: Analyze Objects and Classes of the software system. CO2: Construct object model using object types, attributes, structures and associations. CO3: Analyze Functional and Dynamic Modeling
<b>Subject and code: G 604 .5: SOFTWARE ENGINEERING</b>
<b>Course Outcomes:</b>
CO1: able to draw primitive graphical shapes and perform transformation techniques programmatically. CO2: learn about various new technologies developed and their applications.
<b>Subject and code: G 605 .5: PYTHON PROGRAMMING</b>
<b>Course Outcomes:</b>
CO1 Be skilled at creating, debugging and testing a software application using the Python programming language.
<b>Subject and code: G 606.5: DESIGN AND ANALYSIS OF ALGORITHMS</b>
<b>Course Outcomes:</b>
CO1: Ability to analyze the performance of <i>algorithms</i> . CO2: Ability to choose appropriate <i>algorithm design</i> techniques for solving problems.
<b>G 601.5P: LAB1:JAVA2 ENTERPRISE EDITION</b>
<b>Course Outcomes:</b>
CO1: At the end of the course students will be able to Design/Develop Program CO2: Develop appropriate data model and database scheme CO3: Create and test prototypes
<b>Subject and code: G 602.5P: LAB2: COMPUTER GRAPHICS</b>
<b>Course Outcomes:</b>
CO1: To list the basic concepts used in computer graphics. CO2: To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
<b>Semester- VI</b>

<b>Subject and code : G 601.6: LINUX AND SHELL PROGRAMMING</b>	
<b>Course Outcomes:</b>	
CO1: Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security. CO2: Develop shell scripts to perform more complex tasks.	
<b>Subject and code: G 602. 6: MOBILE COMMUNICATION</b>	
<b>Course Outcomes:</b>	
CO1: To make students familiar with various generations of mobile communications CO2: To understand the concept of cellular communication CO3: To understand the basics of wireless communication CO4: Knowledge of GSM mobile communication standard, its architecture, logical channels, advantages and limitations	
<b>Subject and code: G 603.6: CLOUD COMPUTING</b>	
<b>Course Outcomes:</b>	
CO1: Understand the concepts, characteristics, delivery models and benefits of cloud computing CO2: Understand the key security and compliance challenges of cloud computing	
<b>Subject and code: G 601. 6P: LAB: SHELL PROGRAMMING AND WIREFRAMES</b>	
<b>Course Outcomes:</b>	
CO1: Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security. CO2: Develop shell scripts to perform more complex tasks.	

<b>Department Name:</b>	<b>BV 110</b> <b>B Voc (Retail Management)</b>
<b>PROGRAMME OUTCOMES</b>	
PO1: To make students capable of the applicable National Occupational Standards (NOS) in the Retail Management industry in the national and global context .	
PO2: Students will be able to apply techniques, frameworks and tools to arrive at	

informed decisions in profession and practice.

PO3: Graduates will have a solid foundation to pursue professional careers and take up higher learning courses such as M. Voc., MBA, , M. Phil, Ph.D as well as research.

PO4: Graduates with a flair of self-employment will be able to initiate and build upon entrepreneurial ventures or demonstrate entrepreneurship for their employer organizations.

PO5: Graduate will recognize the need for adapting to change and have the aptitude and ability to engage in independent and life – long learning in the broadest context of socio-economic, technological and global change.

PO6: To provide students with a comprehensive understanding of the theoretical and applied aspects of retail management.

PO7: To inculcate all the desired skills to meet the needs of today's customer by procuring the desired merchandise from the retail stores for their personal use.

PO8: To equip students with skills required to bring the customers into the store and respond to their buying needs

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO1: Develop the knowledge, skill and attitude to creatively and systematically apply in the Retail Management field .

PSO2: Develop fundamental in-depth knowledge and understanding of the techniques, principles, concepts, values, substantive rules and development of the core areas of Retail Management.

PSO3: Exhibit self-confidence and awareness of general issues prevailing in the technological field and in the society and communicate effectively with the other departments, professional fraternity and with society at large through digital and non-digital mediums and using a variety of modes such as effective reports & documentation, effective presentations.

PSO4: Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings by demonstrating life skills, coping skills and human values.

PSO5: Explain theoretical framework of Retail Management Demonstrate the job role of Sales Associate

#### **Semester- I**

#### **Subject and code : Introduction to Retailing**

Course Code: **BV113.1**

#### **Course Outcomes:**

CO1: To provide in-depth understanding of all aspects of retail business.

CO2: To provide an understanding of retailing as an Economic and social process.

<b>Subject and code: Elements of Salesmanship</b> <b>BV 114.1</b>
<b>Course Outcomes:</b>
CO1 : To impart conceptual knowledge of salesmanship and understanding consumer behavior. CO2: To impart knowledge on sales techniques.
<b>Subject and code: STORES LAYOUT AND DESIGN</b> <b>Course Code: BV 116.1P</b>
<b>Course Outcomes:</b>
CO1 : To familiarize the learner with the various facets of retail store and its significance in a retail business. CO2: To understand the practical implications of store layout, space management and store design.
<b>Subject and code: RETAIL STORE OPERATION - 1</b> <b>Course Code: BV 117.1P</b>
<b>Course Outcomes:</b>
CO1: To familiarize with point of sale activities. CO2: To develop customer handling skills.
<b>Semester- II</b>
<b>Subject and code: PRINCIPLES OF MANAGEMENT</b> <b>Course Code: BV 113.2</b>
<b>Course Outcomes:</b>
CO1: To develop the skill of managing business. CO2: To procure managerial skills and abilities.
<b>Subject and code: FUNDAMENTALS OF CUSTOMER SERVICE</b> <b>Course Code: BV 114.2</b>
<b>Course Outcomes:</b>
CO1: To impart the skills required to interact and manage the customers. CO2: To handle efficiently the customer grievances

<b>Subject and code : VISUAL MERCHANDISING</b> <b>Course Code: BV 116.2P</b>
<b>Course Outcomes:</b>
CO1: To equip the students with an overall understanding of significance of visual Merchandising. CO2: To equip in depth knowledge on planogram.
<b>Subject and code : RETAIL STORE OPERATION- 2</b> <b>Course Code: BV 117.2 P</b>
<b>Course Outcomes:</b>
CO1: To familiarize with the organization aspects. CO2: To develop skills to manage customer related issues in Retail sector.
<b>Semester- III</b>
<b>Subject and code:: RETAIL MANAGEMENT</b> <b>Course Code: BV113.3</b>
<b>Course Outcomes:</b>
CO1: Exploring growth opportunities in international retailing CO2: Understanding the Operational challenges faced in retailing
<b>Subject and code:: MARKETING MANAGEMENT</b> <b>Course Code: BV114.3</b>
<b>Course Outcomes:</b>
CO1: Learn the basic concepts of Marketing CO2: Learn the recent trends in marketing and develop marketing skills in retail sector
<b>Subject and code BRAND MANAGEMENT</b> <b>Course Code: BV 116.3 P</b>
<b>Course Outcomes:</b>
CO1: Overall knowledge about Branding CO2: Acquiring knowledge on various areas of branding

<b>Subject and code: RETAIL STORE OPERATION-3</b> <b>Course Code: BV 117.3P</b>
<b>Course Outcomes:</b>
CO1: To familiarize with retail marketing strategies CO2: Hands on experience with store inventory management
<b>Semester- IV</b>
<b>Subject and code: ACCOUNTING FUNDAMENTALS</b> <b>Course Code: BV 113.4</b>
<b>Course Outcomes:</b>
CO1: To develop acquaintance with basic techniques of accountancy. CO2: Providing comprehensive knowledge of maintenance of various books of accounts
<b>Subject and code: ADVERTISING AND SALES PROMOTION</b> <b>Course Code: BV114.4</b>
<b>Course Outcomes:</b>
CO1 : Focus on basic concepts of advertising and sales promotion CO2: Knowledge on digital marketing advertising and sales promotion techniques
<b>Subject and code: MALL MANAGEMENT</b> <b>Course Code: BV 116.4</b>
<b>Course Outcomes:</b>
CO1: Exploring the various areas of Opportunities in mall management CO2: Skills to manage a mall effectively and efficiently
<b>Subject and code: RETAIL STORE OPERATION-4</b> <b>Course Code: BV 117.4 P</b>
<b>Course Outcomes:</b>
CO1: able to draw primitive graphical shapes and perform transformation techniques programmatically. CO2: learn about various new technologies developed and their applications.
<b>Subject and code: Computer Communication and Networks</b> <b>Course Code: G 601 DC 3.4</b>

<b>Course Outcomes:</b>
CO1: To develop practical knowledge on advertisement of FMCG CO2: To develop the ideas of various Advertising strategies in retail
<b>Semester- V</b>
<b>Subject and code: BV 114.5 GENERAL ECONOMICS</b>
<b>Course Outcomes:</b>
CO1: To have a grasp of the elements of economics CO2: To prepare students to face competitive examinations in economics
<b>Subject and code : BV 115.5 MARKETING MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1: To understand the changing business environment CO2: To identify the indicators of management thoughts and practices in marketing CO3: To enhance the analytical skills in solving marketing related problems CO4: To understand the fundamental premise underlying market driven strategies
<b>Subject and code: BV 116.5 CUSTOMER RELATIONSHIP MANAGEMENT</b>
<b>Course Outcomes:</b>
CO1: To explore the practical idea that information about past, present and future customers should form the heart of strategic plans. CO2: To provide a central focus in customer management by understanding market segmentation CO3: To understand attitude/ behavior of customers in the light of creating loyalty.
<b>Subject and code : BV 117.5 E-COMMERCE</b>
<b>Course Outcomes:</b>
CO1: To familiarize the learner with E-Commerce and e-Transition challenges CO2: Analyze different business transaction models, types and parties. CO3: To understand the significance of e-marketing, e-security, e-payment
<b>Semester- VI</b>
<b>Subject and code : BV 113.6 INDUSTRIAL AND RURAL MARKETING</b>
<b>Course Outcomes:</b>
CO1: To learn the basic concepts of industrial marketing and its prominence in the

retail business world CO2: To understand the importance of rural market and its potential CO3: To acquaint the learner with strategic outlook for Industrial and Rural retail marketing scenario	
<b>Subject and code : BV 114.6 RETAIL LOGISTICS MANAGEMENT</b>	
<b>Course Outcomes:</b>	
CO1: The objective of the paper is to provide a comprehensive analysis of the principles and practices of international distribution and logistics. CO2: To examine the basic concepts impacting retail logistics with the goal of understanding how to apply these concepts within the managerial context.	
<b>Subject and code : BV 115.6 IT AND ADMINISTRATION</b>	
<b>Course Outcomes:</b>	
CO1: To learn the basics of Information Technology in Retail sector CO2: To understand the concept of Information Systems in the purview of Information Technology CO3: To understand the conceptual application of Technology in retail business and its outcomes	
<b>Subject and code : BV 116.6 OPERATIONS MANAGEMENT</b>	
<b>Course Outcomes:</b>	
CO1: To develop an understanding of how operations can provide a competitive advantage in the market place. CO2: To develop knowledge of the issues related to designing and managing operations and the techniques to do so. CO3: To evaluate the interaction between operations management and other business functions. CO4: To analyze contemporary theory and applications of manufacturing or service operations in a global business environment	
<b>Subject and code : BV 117.6 FRANCHISING MANAGEMENT</b>	
<b>Course Outcomes:</b>	
CO1: To create an in-depth understanding of Franchising CO2: To familiarize with the Legal and Global aspects of Franchising	

<b>Department Name:</b>	<b>BV 130</b>  <b>B Voc (Food Processing and Engineering)</b>

<b>PROGRAMME OUTCOMES</b>
<p>PO1: Develop skill and expertise in post graduate scholars to work on projects for value addition of various food products</p> <p>PO2: Generate adequate trained man power to work in food processing industries.</p> <p>PO3: Develop cadre of scholars for achieving entrepreneurial skills and self-employment opportunities in food processing sector.</p>
<b>PROGRAMME SPECIFIC OUTCOMES</b>
<p>PSO1: To relate the chemical composition of foods to their functional properties.</p> <p>PSO2: To understand, plan, perform and analyse a range of chemical investigations with an emphasis on food analysis.</p> <p>PSO3: To give a molecular rationalization for the observed physical properties and reactivity of major food component.</p>
<b>Semester- I</b>
<p><b>Subject and code : Basics of food processing</b></p> <p>Course Code: <b>BV 133.1</b></p>
<b>Course Outcomes:</b>
<p>CO1: Outline the process of red and white meat slaughter, explain meat structure and inspect meat quality parameters.</p> <p>CO2: Demonstrate processing techniques used to produce a variety of Food Products.</p> <p>CO3: Work in teams to develop communication skills and company Good Manufacturing Practices</p>
<p><b>Subject and code : Basics of food processing Practical</b></p> <p>Course Code: <b>BV 136.1P</b></p>
<b>Course Outcomes:</b>
<p>CO1: Outline the process of red and white meat slaughter, explain meat structure and inspect meat quality parameters.</p> <p>CO2: Demonstrate processing techniques used to produce a variety of Food Products.</p> <p>CO3: Work in teams to develop communication skills and company Good Manufacturing Practices</p>
<b>Subject and code -FUNDAMENTALS OF FOOD CHEMISTRY AND MICROBIOLOGY</b>

<b>BV-134.1</b>
<b>Course Outcomes:</b>
CO1 : Students shall be aware of the underlying chemistry, properties and effects of processing on food components.
CO2: Understanding of food components reactions and their impact on sensory, nutritional, and functional properties of foods.
CO3:Ability to integrate chemistry and biochemistry principles into real-world food science and nutritional problems..
<b>Subject and code: FUNDAMENTALS OF FOOD CHEMISTRY AND MICROBIOLOGY</b> <b>BV-137.1P</b>
<b>Course Outcomes:</b>
CO1 : Students shall be aware of the underlying chemistry, properties and effects of processing on food components.
CO2: Understanding of food components reactions and their impact on sensory, nutritional, and functional properties of foods.
CO3:Ability to integrate chemistry and biochemistry principles into real-world food science and nutritional problems..
<b>Semester- II</b>
<b>Subject and code: FUNDAMENTALS OF FOOD &amp; NUTRITION</b> <b>BV-133.2</b>
<b>Course Outcomes:</b>
CO1: Demonstrate knowledge and understanding of the fundamental concepts in food and nutrition.
CO2:Demonstrate an in-depth knowledge of the roles and functions of principal nutrients and an awareness of functional foods.
CO3:Demonstrate an understanding of the processes involved in digestion, absorption, metabolism and utilisation of each of the macronutrients and major vitamins and minerals..
<b>Subject and code FUNDAMENTALS OF FOOD &amp; NUTRITION</b> <b>BV-136.2P</b>
<b>Course Outcomes:</b>

CO1: Demonstrate knowledge and understanding of the fundamental concepts in food and nutrition.

CO2: Demonstrate an in-depth knowledge of the roles and functions of principal nutrients and an awareness of functional foods.

CO3: Demonstrate an understanding of the processes involved in digestion, absorption, metabolism and utilisation of each of the macronutrients and major vitamins and minerals..

**Subject and code : – BASICS OF FOOD SAFETY AND REGULATORY ACT**

**BV-134.2**

**Course Outcomes:**

CO1: To create and understand the quality control and assurance system in food industry.

CO2: To understand the risk assessments procedure for food sector.

CO3: GMPs and GHP regulations in the food sector.

**Subject and code PRACTICAL PAPER II Basics of Food Safety and Regulatory Act)**

**BV-137.2P**

**Course Outcomes:**

CO1: Demonstrate knowledge and understanding of the fundamental concepts in food and nutrition.

CO2: Demonstrate an in-depth knowledge of the roles and functions of principal nutrients and an awareness of functional foods.

CO3: Demonstrate an understanding of the processes involved in digestion, absorption, metabolism and utilisation of each of the macronutrients and major vitamins and minerals..

**Semester- III**

**Subject and code: INTRODUCTION TO FRUIT AND VEGETABLE PROCESSING**

**BV 133.3**

**Course Outcomes:**

CO1: The students shall be able to understand Biological, Chemical & Physical

<p>Properties of Fruits &amp; Vegetables.</p> <p>CO2: The students shall be able to understand Technologies involved in Processing, Preservation &amp; Value- Addition of Fruits &amp; Vegetables.</p> <p>CO3: Students shall be able to understand Industrial Processes for Commercial Production of Jams, Jellies, Marmalade, Fruit Juices, Concentrates.</p>
<p><b>Subject and code: INTRODUCTION TO FRUIT AND VEGETABLE PROCESSING</b></p> <p><b>BV 136.3P</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO1: The students shall be able to understand Biological, Chemical &amp; Physical Properties of Fruits &amp; Vegetables.</p> <p>CO2: The students shall be able to understand Technologies involved in Processing, Preservation &amp; Value- Addition of Fruits &amp; Vegetables.</p> <p>CO3: Students shall be able to understand Industrial Processes for Commercial Production of Jams, Jellies, Marmalade, Fruit Juices, Concentrates.</p>
<p><b>Subject and code :INTRODUCTION TO CEREALS, LEGUME AND OIL SEEDS:</b></p> <p><b>BV 134.3</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO1 A greater in-depth understanding of the science and technology associated with grain processing.</p> <p>CO2:Skills in observation, critical analysis and report writing.</p> <p>CO3:An ability to derive, interpret and evaluate social, technical and economic information from a wide variety of sources.</p> <p>CO4: Capacity for independent critical thought, rational inquiry and self-directed learning and research.</p>
<p><b>Subject and code: INTRODUCTION TO CEREALS, LEGUME AND OIL SEEDS:</b></p> <p><b>BV 137.3P</b></p>
<p><b>Course Outcomes:</b></p>
<p>CO1 A greater in-depth understanding of the science and technology associated with grain processing.</p>

CO2:Skills in observation, critical analysis and report writing.

CO3:An ability to derive, interpret and evaluate social, technical and economic information from a wide variety of sources.

CO4: Capacity for independent critical thought, rational inquiry and self-directed learning and research.

**Semester- IV**

**Subject and code: INTRODUCTION TO DAIRY TECHNOLOGY  
BV 133.4**

**Course Outcomes:**

CO1: How to do sampling of milk and milk products.

CO2: Physical, Chemical & Microbial analysis of milk and milk products.

CO3: Development of different milk products.

**Subject and code: INTRODUCTION TO DAIRY TECHNOLOGY  
PRACTICAL  
BV 136.4P**

**Course Outcomes:**

CO1: How to do sampling of milk and milk products.

CO2: Physical, Chemical & Microbial analysis of milk and milk products.

CO3: Development of different milk products.

**Subject and code : INTRODUCTION TO MEAT, FISH AND  
POULTRY PROCESSING  
BV 134.4**

**Course Outcomes:**

CO1: . Student shall know about the significance & necessity of organized animal product sector.

CO2. Students shall acquire the ability of value- addition to Meat, Poultry, Egg & Fish.

CO3. Student shall be well versed with processing, preservation & quality control of Meat, Egg & Fish in Food Industry

**Subject and code: INTRODUCTION TO MEAT, FISH AND  
POULTRY PROCESSING  
BV 137.4P**

<b>Course Outcomes:</b>
CO1: . Student shall know about the significance & necessity of organized animal product sector.
CO2. Students shall acquire the ability of value- addition to Meat, Poultry, Egg & Fish.
CO3. Student shall be well versed with processing, preservation & quality control of Meat, Egg & Fish in Food Industry
<b>Semester- V</b>
<b>Subject and code : BV 134.5- FOOD DRYING AND CONCENTRATION TECHNIQUES</b>
<b>Course Outcomes:</b>
CO1 To gain knowledge on drying principles and psychometric chart To apply the principles to solve problem on drying.
CO2: To understand different types of dryers for different food materials and assess the concept behind industrial dryers.
CO3: The basis for extension of storage life of foods by dehydration and compare and contrast methods for dehydrating different foods, and the onsequences in terms of food quality.
<b>Subject and code : BV 137.5P- FOOD DRYING AND CONCENTRATION TECHNIQUES</b>
<b>Course Outcomes:</b>
CO1 To gain knowledge on drying principles and psychometric chart To apply the principles to solve problem on drying.
CO2: To understand different types of dryers for different food materials and assess the concept behind industrial dryers.
CO3: The basis for extension of storage life of foods by dehydration and compare and contrast methods for dehydrating different foods, and the onsequences in terms of food quality.
<b>Subject and code: BV 135.5- SPICES AND PLANTATION CROP TECHNOLOGY</b>
<b>Course Outcomes:</b>
CO1: To gain knowledge in processing of plantation crops and spices and also its value added products.
CO2: To outline ways in which quality loss can be minimised during preparation and processing

C03: To develop value added products from plantation products and spices
<b>Subject and code: BV 138.5- SPICES AND PLANTATION CROP TECHNOLOGY</b>
<b>Course Outcomes:</b>
CO1: To gain knowledge in processing of plantation crops and spices and also its value added products.  CO2: To outline ways in which quality loss can be minimised during preparation and processing  CO3: To develop value added products from plantation products and spices
<b>Subject and code : BV 136.5- INTRODUCTION TO FERMENTATION TECHNOLOGY and NUTRACEUTICALS</b>
<b>Course Outcomes:</b>
CO1: Evaluate factors that contribute in enhancement of cell and product formation during fermentation process.  CO2: Analyse kinetics of cell and product formation in batch, continuous and fed-batch cultures
<b>Subject and code: BV 139.5P- INTRODUCTION TO FERMENTATION TECHNOLOGY and NUTRACEUTICALS</b>
<b>Course Outcomes:</b>
CO1: Evaluate factors that contribute in enhancement of cell and product formation during fermentation process.  CO2: Analyse kinetics of cell and product formation in batch, continuous and fed-batch cultures
<b>Semester- VI</b>
<b>Subject and code: BV 134.6: - WASTE MANAGEMENT IN FOOD INDUSTRY</b>
<b>Course Outcomes:</b>
CO1: Students will attain knowledge about the methods of managing food wastes.  CO2: Students will gain knowledge on the methods for utilization of food wastes.  CO3: Students will gain knowledge on getting value-added products from wastes

**Subject and code: BV135.6P WASTE MANAGEMENT  
IN FOOD INDUSTRY**

**Course Outcomes:**

CO1: Students will attain knowledge about the methods of managing food wastes.

CO2: Students will gain knowledge on the methods for utilization of food wastes.

CO3: Students will gain knowledge on getting value-added products from wastes

**Department Name:**

**BV 150**

**B Voc (ANIMATION AND  
MULTIMEDIA**

**PROGRAMME OUTCOMES**

PO1. It offers many career profiles for trained and qualified candidates.

PO2: It can educate them with the specific know-how about the various subject areas such as Animation Film Production and Pre-Production

PO3: It widens the creative talent and improves technical skills, gives more focus on visualization techniques improve communication skill with good networking skills, flexibility to work on different aspects of animation..

**PROGRAMME SPECIFIC OUTCOMES**

PSO 1 : Understand the basic elements of art and/or design through art analysis

PSO2 : Learn how to use materials, tools and processes, effectively and safely to create original works of art.

PSO3: Develop creative problem-solving strategies as a means to create strong artwork. Identify Western art in detail

**Semester- I**

**Subject and code: History of Animation**

**BV 153.1**

**Course Outcomes:**

CO1: Describe past history of origin of animation.
CO2: Understand the emergence of animation from different countries.
CO3: Understand the importance and the rise of computer animation
<b>Subject and code: Computer Graphics Design</b> <b>BV 154.1</b>
<b>Course Outcomes:</b>
CO1: Gain awareness of common computer graphics software.
CO2: To understand different vector and Bitmap shapes and designs.
CO3: Enhance their ability to design and learn implementation of colors
<b>Subject and code: Stop Motion lab</b> <b>BV 156.1P</b>
<b>Course Outcomes:</b>
CO1: Analyse, evaluate and critically reflect on stop motion works and texts;
CO2: Apply pre-production techniques and design methodology, including storyboarding and animatic creation;
CO3: Demonstrate creative thinking when combining fundamental principles of visual and narrative design with motion principles;
<b>Subject and code: Computer Fundamentals Lab</b> <b>BV 157.1P</b>
<b>Course Outcomes:</b>
CO1: introduced to computer hardware and its various components.
CO2: Understanding different hardware devices and their applications.
CO3: Get the knowledge of MS Office, its options, features.
<b>Semester- II</b>
<b>Subject and code: Foundation Art</b> <b>BV 153.2</b>
<b>Course Outcomes:</b>
CO1: Understand the basic elements of art and/or design through art analysis.
CO2: Learn how to use materials, tools and processes, effectively and safely to create original works of art.

CO3: Develop creative problem-solving strategies as a means to create strong artwork.

**Subject and code: 3D Modelling**

**BV 154.2**

**Course Outcomes:**

CO1: Knowledge about using 3D applications and understand the fundamental skills of 3D space

CO2: Creating different types of polygon models

CO3: Creating 3D objects using line & NURBS

CO4: Creating interior designs & exterior designs

CO5: Rendering and exporting 3D files in different image file formats.

CO6: Create different 3D environments, models, structures, architectures.

CO7: Understanding how mesh works in 3D modelling.

**Subject and code: Script Writing & Storyboarding Lab**

**BV 156.2P**

**Course Outcomes:**

CO1: Create a story which involves turning points, setups, climax. etc.

CO2: Create a series of legible storyboard as required by the script.

CO3: Understand Pre- Production process

**Subject and code: 3D Modelling Lab**

**BV 157.2P**

**Course Outcomes:**

CO1: Knowledge about using 3D applications and understand the fundamental skills of 3D space

CO2: Creating different types of polygon models

CO3: Creating 3D objects using line & NURBS

CO4: Creating interior designs & exterior designs

CO5: Rendering and exporting 3D files in different image file formats.

CO6: Create different 3D environments, models, structures, architectures.

CO7: Understanding how mesh works in 3D modelling.

Semester- III	
<b>Subject and code: 2D Animation</b>	
<b>BV 153.3</b>	
<b>Course Outcomes:</b>	
C01: Gain knowledge about fundamental skills to produce traditional style animation.	
C02: Have a better understanding about timeline, tools and features of the software.	
<b>Subject and code: Production Techniques</b>	
<b>BV 154.3</b>	
<b>Course Outcomes:</b>	
C01: Understanding the process of voice tracking.	
C02: Implementing the concepts of transitions, layering, Video capture.	
C03: Learning different types of audio/ video formats	
<b>Subject and code: Production Techniques Lab</b>	
<b>BV 156.3P</b>	
<b>Course Outcomes:</b>	
C01: Understanding the process of voice tracking.	
C02: Implementing the concepts of transitions, layering, Video capture.	
C03: Learning different types of audio/ video formats	
<b>Subject and code: Comic Art &amp; Design Lab</b>	
<b>BV 157.3P</b>	
<b>Course Outcomes:</b>	
C01: Generate a balanced knowledge in the humanities, both in and out of the sequential art field.	
C02: Use the potential of comics to disseminate a wide range of information	
C03: Exhibit knowledge of professional workflow, expectation, and market	
Semester- IV	
<b>Subject and code: 3D Texturing &amp; Lighting</b>	

<b>BV 153.4</b>
<b>Course Outcomes:</b>
CO1: Give detailed texturing and colouring to 3D characters or objects. CO2: Learn the importance of shaders and how to apply it. CO3: Understand different mapping done to enhance the details of the object.
<b>Subject and code: Web technology</b>
<b>BV 154.4</b>
<b>Course Outcomes:</b>
CO1: Create and design websites. CO2: Understand the development process and its principles to create a website. CO3: Create different types of websites themes and do different modifications onto websites.
<b>Subject and code: 3D Texturing &amp; Lighting Lab</b>
<b>BV 156.4P</b>
<b>Course Outcomes:</b>
CO1: Give detailed texturing and colouring to 3D characters or objects. CO2: Learn the importance of shaders and how to apply it. CO3: Understand different mapping done to enhance the details of the object.
<b>Subject and code: Web technology Lab</b>
<b>BV 157.4P</b>
<b>Course Outcomes:</b>
CO1: Create and design websites. CO2: Understand the development process and its principles to create a website. CO3: Create different types of websites themes and do different modifications onto websites.
<b>Semester- V</b>
<b>Subject and code: 1. 3D RIGGING &amp; ANIMATION</b>
<b>Course Outcomes:</b>
CO1: Develop skills in creating objects and character animations.

CO2: Understand the fundamental features of different controllers, wraps and modifiers, poses and postures. CO3: Work with bone parameters and IK Solvers
<b>Subject and code: 6 3D ANIMATION LAB</b>
<b>Course Outcomes:</b>
CO1: Develop skills in creating objects and character animations. CO2: Understand the fundamental features of different controllers, wraps and modifiers, poses and postures. CO3: Work with bone parameters and IK Solvers
<b>Subject and code: 2D CHARACTER &amp; ENVIRONMENT SKETCHING</b>
<b>Course Outcomes:</b>
CO1: Study user interface of Fusion along with features & applications. CO2: Develop skills in understanding node based features
<b>Subject and code: VISUAL EFFECTS</b>
<b>Course Outcomes:</b>
CO1: Study user interface of Fusion along with features & applications. CO2: Develop skills in understanding node based features. CO3: Get acquainted with the knowledge of rotoscoping, keying, tracking etc using node based technology
<b>Subject and code: VISUAL EFFECTS LAB</b>
<b>Course Outcomes:</b>
CO1: Study user interface of Fusion along with features & applications. CO2: Develop skills in understanding node based features. CO3: Get acquainted with the knowledge of rotoscoping, keying, tracking etc using node based technology
<b>Semester- VI</b>
<b>Subject and code: UI/ UX DESIGN</b>
<b>Course Outcomes:</b>
CO1: learn human-centered design methods and rhetoric that ground your design in the

needs of the public.
CO2: learn how to use interaction design and design systems through industry-standard quality assurance methods, and how to design and implement user interfaces to follow corporate strategies.
<b>Subject and code:    ADVANCED CHARACTER ILLUSTRATION</b>
<b>Course Outcomes:</b>
CO1: Understand different types of characters needed for animation and gaming. CO2: Understand lightings for different conditions. CO3: Create their own characters with construction.
<b>Subject and code:    3D SCULPTURE DESIGN</b>
<b>Course Outcomes:</b>
CO1: Create realistic digital sculpting using ZBrush. CO2: Understand the workspace, buttons and palettes and use it more efficiently. CO3: Create desired UV textures to give more subtle look to 3D characters or objects.
<b>Subject and code:    DYNAMICS LAB</b>
<b>Course Outcomes:</b>
CO1: Create dynamic particle effects using particle systems. CO2: Gain knowledge about 2D and 3D Fluid systems. CO3: To Understand Active Passive Colliders.

<b>Department Name:</b>	<b>BV 160</b> <b>B Voc (RENEWABLE ENERGY MANAGEMENT)</b>
<b>PROGRAMME OUTCOMES</b>	

PO1: To create several self-employment opportunities in renewable energy and energy efficiency sectors

PO2: Become an expert in theoretical as well as practical aspects of renewable energy technologies, energy conservation, and management

PO3: Develop a thorough understanding of Renewable energy resources like solar energy, wind energy, tidal energy etc.

PO4: Participate in training programs like Hands on Training (HOT), On the Job Training (OJT) in Renewable energy Industries that enhances their ability to work

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO 1 : Vocational training in the areas of renewable, clean energy, and energy management.

PSO2: Advanced understanding of the effect of human activities on the environment.

PSO3: Lessons in the socio-economic and business issues influencing delivery of the technology.

#### **Semester- I**

**Subject and code: Fundamentals of Physics**

**BV 173.1**

##### **Course Outcomes:**

CO1: Ability to correlate different physical parameters required for the functioning of energy devices

CO2: Understand the functioning of various renewable energy devices

**Subject and code: Basic Electronics**

**BV 174.1**

##### **Course Outcomes:**

CO1: Understand the basic terminology/definitions of electrical and electronics engineering

CO2. Apply the knowledge of theorems/laws to analyze the simple circuits

CO3. Use the principles of electromagnetic induction in electrical applications.

**Subject and code: Fundamentals of Physics- Lab**

<b>BV 177.1P</b>
<b>Course Outcomes:</b>
CO1: Ability to correlate different physical parameters required for the functioning of energy devices CO2: Understand the functioning of various renewable energy devices
<b>Subject and code: Basic Electronics Lab</b>
<b>BV 178.1P</b>
<b>Course Outcomes:</b>
CO1: Understand the basic terminology/definitions of electrical and electronics engineering CO2. Apply the knowledge of theorems/laws to analyze the simple circuits CO3. Use the principles of electromagnetic induction in electrical applications.
<b>Semester- II</b>
<b>Subject and code: PHOTOMETRY, HEAT AND THERMODYNAMICS</b>
<b>BV 173.2</b>
<b>Course:</b>
CO1: have a clear and basic of fundamental concept of photometry in order to estimate available light energy. CO2: demonstrate the capability of designing and developing energy harvesting devices solar water heaters, solar cookers and heat pumps. CO3: design and fabricate heat harvesting devices in order to optimize the utilization of heat energy.
<b>Subject and code: Fundamentals of solar Energy &amp; Photo Voltaic Technology</b>
<b>BV 174.2</b>
<b>Course Outcomes:</b>
CO1: Students will learn how solar cells convert light into electricity, CO2: how solar cells are manufactured, how solar cells are evaluated, CO3: what technologies are currently on the market, and how to evaluate the risk CO4: potential of existing and emerging solar cell technologies.
<b>Subject and code: PHOTOMETRY, HEAT AND THERMODYNAMICS</b>
<b>BV 176.2P</b>
<b>Course Outcomes:</b>

CO1: have a clear and basic of fundamental concept of photometry in order to estimate available light energy.

CO2: demonstrate the capability of designing and developing energy harvesting devices solar water heaters, solar cookers and heat pumps.

CO3: design and fabricate heat harvesting devices in order to optimize the utilization of heat energy.

**Subject and code: : Fundamentals of solar Energy & Photo Voltaic Technology Lab**

**BV 177.2P**

**Course Outcomes:**

CO1: Students will learn how solar cells convert light into electricity,

CO2: how solar cells are manufactured, how solar cells are evaluated,

CO3: what technologies are currently on the market, and how to evaluate the risk

CO4: potential of existing and emerging solar cell technologies.

### **Semester- III**

**Subject and code: Basics of Computer Application**

**BV 174.3**

**Course Outcomes:**

CO1: Apply algorithmic, mathematical and scientific reasoning to a variety of computational problems.

CO2: Design, correctly implement and document solutions to significant computational problems.

CO3: Analyze and compare alternative solutions to computing problems.

**Subject and code: Basics of Electricity**

**BV 175.3**

**Course Outcomes:**

CO1: To enable the students to design and troubleshoot electrical circuits, networks and appliances through hands-on mode.

CO2: To develop the basic understanding of household electrical networking and its function.

**Subject and code Basics of Computer Application Lab**

**BV 177.3P**

<b>Course Outcomes:</b>
CO1: Apply algorithmic, mathematical and scientific reasoning to a variety of computational problems.
CO2: Design, correctly implement and document solutions to significant computational problems.
CO3: Analyze and compare alternative solutions to computing problems.
<b>Subject and code:    Basics of ElectricityLab</b> <b>BV 178.3P</b>
<b>Course Outcomes:</b>
CO1: To enable the students to design and troubleshoot electrical circuits, networks and appliances through hands-on mode.
CO2:To develop the basic understanding of household electrical networking and its function.
<b>Semester- IV</b>
<b>Subject and code:    Storage Devices and Invertors</b> <b>BV 174.4</b>
<b>Course Outcomes:</b>
CO1: List types of batteries and their operating principles.
CO2: Demonstrate battery maintenance and testing techniques.
CO3: Utilize correctly the various types of test equipment and hand tools
<b>Subject and code:    Fluid Mechanics</b> <b>BV 175.4</b>
<b>Course Outcomes:</b>
CO1: Develop an ability in basic fundamental concepts of hydrostatics and hydrodynamics.
CO2: Calculate and estimate the amount of available energy for the end utilization for maximum efficiency
CO3: Select and suggest suitable energy storing mechanisms depending on the available resources in the environment and also go for higher studies in the relevant field
<b>Subject and code:    :    Storage Devices and InvertorsLab</b> <b>BV 177.4P</b>

<b>Course Outcomes:</b>
CO1: List types of batteries and their operating principles. CO2: Demonstrate battery maintenance and testing techniques. CO3: Utilize correctly the various types of test equipment and hand tools
<b>Subject and code: Fluid Mechanics Lab BV 178.4P</b>
<b>Course Outcomes:</b>
CO1: Develop an ability in basic fundamental concepts of hydrostatics and hydrodynamics. CO2: Calculate and estimate the amount of available energy for the end utilization for maximum efficiency CO3: Select and suggest suitable energy storing mechanisms depending on the available resources in the environment and also go for higher studies in the relevant field
<b>Semester- V</b>
<b>Subject and code: BIOMASS ENERGY</b>
<b>Course Outcomes:</b>
CO1: Learn the various methods of harvesting biomass. CO2: Gain knowledge in converting biomass into fuel. CO3: Suggest various techniques of utilization of biomass.
<b>Subject and code: BIOMASS ENERGY LAB</b>
<b>Course Outcomes:</b>
CO1: Learn the various methods of harvesting biomass. CO2: Gain knowledge in converting biomass into fuel. CO3: Suggest various techniques of utilization of biomass.
<b>Subject and code: Geothermal Energy</b>
<b>Course Outcomes:</b>
CO1: Develop an ability in basic fundamental concepts of tapping geothermal energy. CO2: Suggest appropriate designs for tapping geothermal energy based on locations
<b>Subject and code: Geothermal Energy LAB</b>
<b>Course Outcomes:</b>
CO1: Develop an ability in basic fundamental concepts of tapping geothermal energy. CO2: Suggest appropriate designs for tapping geothermal energy based on locations

<b>Semester- VI</b>
<b>Subject and code: INSTALLATION AND MAINTENANCE OF RENEWABLE ENERGY DEVICES</b>
<b>Course Outcomes:</b>
<p>CO1: Course focus is on solar power projects development and quality management.</p> <p>CO2: The participants will gain knowledge and will have the opportunity to understand renewable energy project management, site assessment and planning, feasibility study and detailed project report preparation.</p> <p>CO3: Design and installation best practices, PV system performance modelling and energy yield assessment, Hands on training on consideration of various factors, inspection procedure and quality assurance</p>
<b>Subject and code: Materials and Processes in Manufacturing</b>
<b>Course Outcomes:</b>
<p>CO1: demonstrate the capability of selecting suitable manufacturing processes to manufacture the products optimally,</p> <p>CO2: ability to clear basic fundamental concepts of machining, welding, casting, forming processes</p> <p>CO3: selecting or suggesting suitable manufacturing processes to achieve the required products with the aim of avoiding material and time wastage.</p>
<b>Subject and code: Materials and Processes in Manufacturing LAB</b>
<b>Course Outcomes:</b>
<p>CO1: demonstrate the capability of selecting suitable manufacturing processes to manufacture the products optimally,</p> <p>CO2: ability to clear basic fundamental concepts of machining, welding, casting, forming processes</p> <p>CO3: selecting or suggesting suitable manufacturing processes to achieve the required products with the aim of avoiding material and time wastage.</p>
<b>Subject and code: BIOMASS ENERGY</b>
<b>Course Outcomes:</b>
<p>CO1: Learn the various methods of harvesting biomass.</p> <p>CO2: Gain knowledge in converting biomass into fuel.</p> <p>CO3: Suggest various techniques of utilization of biomass.</p>


<b>Department Name:</b>	<b>BV 170</b> <b>B Voc SOFTWARE DEVELOPMENT</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO1: Understand, Analyze and Develop computer programs in the areas related to Object-oriented concepts, Web designing and Algorithms.</p> <p>PO2: Develops the necessary skills to make a career in the field of computers.</p> <p>PO3: Building ability to work as a member or leader of a team in multi disciplinary environment.</p> <p>PO4: Develops the ability to select modern computing tools, skills and technique necessary for innovative software solutions.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO1: Producing knowledgeable and skilled human resources to be employable in IT Industry.</p> <p>PSO2: Exploring the skills of students to become entrepreneurs who can develop customized solutions for small and medium enterprises.</p>	
<b>Semester- I</b>	
<b>Subject and code:   Programming in C</b>  <b>BV 163.1</b>	
<b>Course Outcomes:</b>	
<p>CO1: Read, understand and trace the execution of programs written in C language</p> <p>CO2: Write the C code for a given problem</p> <p>CO3: Perform input and output operations using programs in C</p> <p>CO4: Write programs that perform operations on arrays</p>	
<b>Subject and code:   Information Technology Tools</b>	

<b>BV 164.1</b>
<b>Course Outcomes:</b>
CO1: Understand the fundamentals of computer system CO2: Identify different components within the computer system CO3: Understand different types of input and output devices CO4: Demonstrate the working concepts of different devices connected to computer CO5: Explain different generations of programming languages and their significance CO6: Understand the use of Word processing, Spreadsheet, Presentation and DBMS applications CO7: Understand Digital computer and digital systems functioning
<b>Subject and code:   Programming in C lab</b>
<b>BV 166.1P</b>
<b>Course Outcomes:</b>
CO1: Read, understand and trace the execution of programs written in C language CO2: Write the C code for a given problem CO3: Perform input and output operations using programs in C CO4: Write programs that perform operations on arrays
<b>Subject and code:   Information Technology Tools Lab</b>
<b>BV 167.1P</b>
<b>Course Outcomes:</b>
CO1: Understand the fundamentals of computer system CO2: Identify different components within the computer system CO3: Understand different types of input and output devices CO4: Demonstrate the working concepts of different devices connected to computer CO5: Explain different generations of programming languages and their significance CO6: Understand the use of Word processing, Spreadsheet, Presentation and DBMS applications CO7: Understand Digital computer and digital systems functioning
<b>Semester- II</b>
<b>Subject and code:   Web Designing</b>

<b>BV 163.2</b>
<b>Course Outcomes:</b>
CO1: Understand features of Internet and email CO2: Develop Simple web pages using HTML & Style Sheets CO3: Develop interactive web page using scripting language.
<b>Subject and code: Relational Database Management System</b> <b>BV 164.2</b>
<b>Course Outcomes:</b>
CO1: Understand the basic concepts and the applications of database systems. CO2: Master the basics of SQL and construct queries using SQL. CO3: Understand the relational database design principles.
<b>Subject and code : Web Designing Lab</b> <b>BV 166.2P</b>
<b>Course Outcomes:</b>
CO1: Understand features of Internet and email CO2: Develop Simple web pages using HTML & Style Sheets CO3: Develop interactive web page using scripting language.
<b>Subject and code : Relational Database Management System Lab</b> <b>BV 167.2P</b>
<b>Course Outcomes:</b>
CO1: Understand the basic concepts and the applications of database systems. CO2: Master the basics of SQL and construct queries using SQL. CO3: Understand the relational database design principles.
<b>Semester- III</b>
<b>Subject and code: Java Programming</b> <b>BV 163.3</b>
<b>Course Outcomes:</b>
CO1: Know the structure and model of the Java programming language CO2: Develop software using the Java programming language and Choose an

engineering approach to solving problems, starting from the acquired knowledge of programming and knowledge of operating systems.
<b>Subject and code:    Web Programming using PHP</b> <b>BV 164.3</b>
<b>Course Outcomes:</b>
CO1: Be able to setup and configure MySQL, PHP, Apache web server development environment. CO2: Understand Object oriented programming paradigm in PHP. And build a simple, functional web application using PHP/MySQL.
<b>Subject and code:    Java Programming Lab</b> <b>BV 166.3P</b>
<b>Course Outcomes:</b>
CO1: Know the structure and model of the Java programming language CO2: Develop software using the Java programming language and Choose an engineering approach to solving problems, starting from the acquired knowledge of programming and knowledge of operating systems.
<b>Subject and code Web Programming using PHP Lab</b> <b>BV 167.3P</b>
<b>Course Outcomes:</b>
CO1: Be able to setup and configure MySQL, PHP, Apache web server development environment. CO2: Understand Object oriented programming paradigm in PHP. And build a simple, functional web application using PHP/MySQL.
<b>Semester- IV</b>
<b>Subject and code:    Data Structures using C</b> <b>BV 163.4</b>
<b>Course Outcomes:</b>
CO1: To describe the usage of various data structures CO2:To choose the appropriate data structure to solve a programming problem.

CO3:To demonstrate various methods of organizing large amounts of data. .
<b>Subject and code: Computer Network Security BV 164.4</b>
<b>Course Outcomes:</b>
CO1: At the end of the course the students will be able to understand the architectural principles of computer networking and compare different approaches to organizing networks. CO2: Identify core networking and infrastructure components and the roles they serve. CO3: Students will get the technical knowledge and skills needed to protect and defend computer systems and networks
<b>Subject and code: Data Structures using C Lab BV 166.4P</b>
<b>Course Outcomes:</b>
CO1: To describe the usage of various data structures CO2:To choose the appropriate data structure to solve a programming problem. CO3:To demonstrate various methods of organizing large amounts of data. .
<b>Subject and code: Computer Network Security Lab BV 167.4P</b>
<b>Course Outcomes:</b>
CO1: At the end of the course the students will be able to understand the architectural principles of computer networking and compare different approaches to organizing networks. CO2: Identify core networking and infrastructure components and the roles they serve. CO3: Students will get the technical knowledge and skills needed to protect and defend computer systems and networks
<b>Semester- V</b>
<b>Subject and code: JAVA 2 ENTERPRISE EDITION</b>
<b>Course Outcomes:</b>

CO1: At the end of the course students will be able to Design/Develop Program CO2: Develop appropriate data model and database scheme CO3: Create and test prototypes
<b>Subject and code: JAVA 2 ENTERPRISE EDITION <u>LAB</u></b>
<b>Course Outcomes:</b>
CO1: At the end of the course students will be able to Design/Develop Program CO2: Develop appropriate data model and database scheme CO3: Create and test prototypes
<b>Subject and code: COMPUTER GRAPHICS AND MULTIMEDIA</b>
<b>Course Outcomes:</b>
CO1: To list the basic concepts used in computer graphics. CO2: To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
<b>Subject and code: SOFTWARE ENGINEERING</b>
<b>Course Outcomes:</b>
CO-1. Assess professional and ethical responsibility, software engineering principles and activities involved in building large software programs. CO-2. Demonstrate process of requirements gathering, classification, Specification & validation. CO-3. Design models for software system, component and process Within realistic constraints. CO-4. Apply cost estimation and time scheduling for quality project Activities. CO-5. Apply, design, implement, verify, validate and maintain software Systems with metrics.
<b>Subject and code: PYTHON PROGRAMMING</b>
<b>Course Outcomes:</b>
CO1: Be skilled at creating, debugging and testing a software application using the Python programming language.
<b>Subject and code: PYTHON PROGRAMMING LAB</b>
<b>Course Outcomes:</b>
CO1: Be skilled at creating, debugging and testing a software application using the Python programming language.
<b>Semester- VI</b>
<b>Subject and code: LINUX AND SHELL PROGRAMMING</b>

<b>Course Outcomes:</b>
CO1: Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security. CO2: Develop shell scripts to perform more complex tasks.
<b>Subject and code:    LINUX AND SHELL PROGRAMMING LAB</b>
<b>Course Outcomes:</b>
CO1: Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security. CO2: Develop shell scripts to perform more complex tasks.
<b>Subject and code:    CLOUD COMPUTING</b>
<b>Course Outcomes:</b>
CO1: Understand the concepts, characteristics, delivery models and benefits of cloud computing CO2: Understand the key security and compliance challenges of cloud computing
<b>Subject and code:    ANDROID APPLICATION DEVELOPMENT</b>
<b>Course Outcomes:</b>
CO1: Install and configure Android application development tools. CO2: Design and develop user Interfaces for the Android platform. CO3: Save state information across important operating system events. CO4: Apply Java programming concepts to Android application development.
<b>Subject and code:    ANDROID APPLICATION DEVELOPMENT LAB</b>
<b>Course Outcomes:</b>
CO1: Install and configure Android application development tools. CO2: Design and develop user Interfaces for the Android platform. CO3: Save state information across important operating system events. CO4: Apply Java programming concepts to Android application development.
<b>Subject and code:    INTERNET OF THINGS</b>
<b>Course Outcomes:</b>
CO1: identify the Components that forms part of IoT Architecture. CO2: determine the most appropriate IoT Devices and Sensors based on Case Studies. CO3: setup the connections between the Devices and Sensors. CO4: evaluate the appropriate protocol for communication between IoT. CO5: analyse the communication protocols for IoT.

<b>Department Name:</b>	<b>GENERAL ENGLISH</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO1: Students undergoing the program will improve their basic English language skills like reading, listening, comprehending, speaking, debating and writing</p> <p>PO2: Learners will gain confidence to use an international language and become competent global citizens in an age of globalization</p> <p>PO3: Teaching language for first generation learners</p> <p>PO4: Multicultural and multi lingual approach.</p>	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO 1: Students will improve their reading and interpreting skills by introducing them to texts on specific social, economic, cultural, political issues. Such texts through their contemporaneity will contextualize language and help students to think critically and articulate their thoughts in classroom discussions.</p> <p>PSO2: They will learn to communicate with teachers, their peers and other with speakers in public domain using English language. They will be able to read and comprehend reference materials related to core subjects of their discipline. They should be able to read English language newspapers and also understand English language content available on television and also social media platforms</p> <p>PSO3: Students should also be able to distinguish between formal, colloquial, journalistic, poetic, scientific forms and registers of language.</p>	
<b>Course Outcomes:</b>	

CO1: reading competence through engagement with challenging texts of selected prose, poetry and short stories

CO2: logical thinking, analytical skills and critical thinking abilities through such engagement

CO3: Conversation skills through Dialogue Writing

CO4: Logical thinking through completing a story by following guiding hints

CO5: Metaphorical use of language through Idioms and Phrases

CO6: Using appropriate Articles and Prepositions

CO7: How to use Question Tags?

CO8: Vocabulary building / semantics / etymology

CO9: Skills of paraphrasing by practice of Precis Writing

CO10: Appropriate use of collocations, Phrasal verbs and Tense forms.

CO11: Report Writing – Business Report, Writing Minutes of meetings

CO12: Framing ‘Wh’ Questions, Use of Active and Passive voice, Direct and Indirect speech

CO13: Critical thinking through analyzing a Cartoon

CO14: Grammatically correct use of Sub- Verb agreement

**Department Name:**

**ADDITIONAL ENGLISH**

**PROGRAMME OUTCOMES**

PO1: Students undergoing the program will improve their basic English language skills like reading, listening, comprehending, speaking, debating and writing

PO2: Learners will gain confidence to use an international language and become competent global citizens in an age of globalization

PO3: Teaching language for first generation learners

PO4: Multicultural and multi lingual approach.

**PROGRAMME SPECIFIC OUTCOMES**

PSO 1: Students will improve their reading and interpreting skills by introducing them to texts on specific social, economic, cultural, political issues. Such texts through their contemporaneity will contextualize language and help students to think critically and articulate their thoughts in classroom discussions.

PSO2: They will learn to communicate with teachers, their peers and others with speakers in public domain using English language. They will be able to read and comprehend reference materials related to core subjects of their discipline. They should be able to read English language newspapers and also understand English language content available on television and also social media platforms

PSO3: Students should also be able to distinguish between formal, colloquial, journalistic, poetic, scientific forms and registers of language.

#### **Course Outcomes:**

CO1: reading competence through engagement with challenging texts of selected prose, poetry and short stories

CO2: logical thinking, analytical skills and critical thinking abilities through such engagement

CO3: Conversation skills through Dialogue Writing

CO4: Logical thinking through completing a story by following guiding hints

CO5: Metaphorical use of language through Idioms and Phrases

CO6: Using appropriate Articles and Prepositions

CO7: How to use Question Tags?

CO8: Vocabulary building / semantics / etymology

CO9: Skills of paraphrasing by practice of Precis Writing

CO10: Appropriate use of collocations, Phrasal verbs and Tense forms.

**Department Name:**

**COMMUNICATIVE ENGLISH**

**PROGRAM OUTCOMES**

- It is basically aimed at developing core competence in various aspects of communication most essential in occupational functions in the field of Journalism, Business and entrepreneurship.
- It is also intended to help students understand the difference between formal and informal use of language
- The focus is largely on Speaking, Writing and listening skills

#### **PROGRAM SPECIFIC OUTCOMES**

- Introducing students to the sounds of English language by teaching them the basics of phonetics
- Give students a better understanding of grammar, usage and vocabulary of English language
- Introduce students to writing strategies and train them in soft skills
- Introduce students to the specific language skills required to write for the media
- Develop skills of persuasion by training students in the use of rhetoric and logic in speech and writing
- Technical writing skills: Business English Communication
- Social skills through conversational language, inter-personal communication and Event Management

#### **Course Outcomes (CO 3)**

- Introducing Students to Sounds of English.
- Introducing the concept of morphology and morpho- phonemics.
- Enhancing LSRW skills in the students through advanced phonetics.
- Introducing concepts of Word Stress, Sentence Stress and Intonation.
- Develop the skills of Grammar and Vocabulary.
- prepare students for various competitive exams.
- language proficiency, effective presentation and skills of Interaction.
- understanding language skills required for broadcast media.
- understanding of terms such as, fact, truth, subjectivity, objectivity and bias
- understanding various genres of Media Writing, techniques of reporting, reviewing, interviewing and commentary.
- rhetorical devices in writing and speech. skills of Technical Writing
- Language use in blogging and its nuances, editing and indexing skills

<b>Department Name:</b>	<b>ENGLISH MAJOR</b>
<b><u>PROGRAM OUTCOMES</u></b>	
<ul style="list-style-type: none"> <li>➤ Students are introduced to various literatures from across the world alongside a survey of canonical British writers</li> <li>➤ They are introduced to concepts of colonialism, post colonialism, nativism, culturalism and identity</li> <li>➤ They are introduced to various critical and theoretical approaches to help them develop their critical thinking abilities</li> </ul>	
<b><u>PROGRAM SPECIFIC OUTCOMES</u></b>	
<ul style="list-style-type: none"> <li>➤ Knowledge of British social and cultural history through introduction to canonical texts of British literature</li> <li>➤ Understanding of diverse cultural contexts of different nations, geographies and people through selected texts of renowned authors</li> <li>➤ Understanding of Modernism through introduction to relevant texts of prose, poetry, drama and fiction of the 20<sup>th</sup> century</li> <li>➤ Knowledge of concepts such as nation, nationalities, race and civilization through introduction to selected texts from the period of Indian nationalist struggle</li> <li>➤ Knowledge of concepts like colony, colonization and Postcolonialism through historical understanding of relevant texts</li> <li>➤ Understanding the concept of literary criticism and literary theory. Knowledge of various theories necessary for interpretation of texts</li> <li>➤ Introduction to concepts and theories of culture, ideologies of culture and critical analysis of cultural aspects represented in literature</li> <li>➤ Understanding concepts of gender, sexuality, hetero-normativity, patriarchy, sexism, gender relations and embodiment.</li> </ul>	
<b><u>Course Outcomes (CO 3)</u></b>	
<ul style="list-style-type: none"> <li>➤ To introduce students to the major works of English literature.</li> <li>➤ To understand different periods in the history of English literature.</li> <li>➤ To understand works in different genres of literature.</li> <li>➤ To introduce students to Literature from various regions of the world.</li> <li>➤ To give an understanding of social and cultural contexts across the world.</li> <li>➤ To bring a global perspective on literature</li> </ul>	

- To understand the beginnings of Modernism.
- To explore the realms of Literary Modernism in English literature.
- To understand the different movements and literary styles associated with modernism.
- To understand concepts of colonialism, postcolonialism, neo-imperialism
- To analyze the social, political and historical impact of colonization and native responses to it
- To study structures of power underlying colonialism, nativism
- To understand the impact of colonization on language
- To examine literary works, theatre and films from a postcolonial perspective
- To trace the changing approaches to literary studies
- To give an understanding of the philosophical background of ancient western classical criticism
- To chart the transition from literary criticism to theory
- To give an overview of modern critical practices
- To explore concepts of Nationalism/Nation, Colonization, Gender, Caste
- To understand the socio-historical background of anti-colonial nationalism
- To locate current discourse of cultural nationalism in late Nineteenth century Social Reform Movement
- To study autobiographical, literary works, plays, fiction written in response to nationalism, partition and post-colonial nation-state
- To understand the historical evolution of the meanings of culture
- To understand the distinction between symbolic culture and culture as lived practice
- To explore cultural identities of race, class, gender and nation in literary texts
- To examine cultural signifiers in visual and literary texts
- To understand the concept of gender as a social construct
- To examine the ideological underpinnings of masculinity, femininity
- To analyse the alternate nature of sexuality
- To examine the ways in which gender intersects with different categories such as class, race, nation

Department Name:	ಕನ್ನಡ ಐಚ್ಛಿಕ ಪತ್ರಿಕೆ
<p><b>ಕನ್ನಡ ಐಚ್ಛಿಕ ಪತ್ರಿಕೆ ಕಾರ್ಯಕ್ರಮದ ಫಲಿತಾಂಶ (P0 2 )</b></p> <p><b>ಪ್ರಸ್ತಾವನೆ</b></p> <p>ಕನ್ನಡ ಭಾಷೆ ಹಾಗೂ ಸಾಹಿತ್ಯಕ್ಕೆ ಪ್ರಾಚೀನವಾದ ಇತಿಹಾಸವಿದೆ. ಭಾರತದ ಪ್ರಾಚೀನ ಸಾಹಿತ್ಯ ಹಾಗೂ ಸಾಹಿತ್ಯ ಸಂಪನ್ನ ಭಾಷೆಗಳಲ್ಲಿ ಕನ್ನಡವೂ ಒಂದು. ಈ ಭಾಷೆಯ ಪ್ರಾಚೀನತೆ ಹಾಗೂ ಅದರಲ್ಲಿನ ಸಾಹಿತ್ಯ ಸಂಪನ್ನತೆ, ಸಾಂಸ್ಕೃತಿಕ ಮೌಲ್ಯಗಳನ್ನು ಗಮನಿಸಿ ಕೇಂದ್ರ ಸರ್ಕಾರವು ಕನ್ನಡಕ್ಕೆ ಶಾಸ್ತ್ರೀಯ ಭಾಷೆಯ ಸ್ಥಾನ-ಮಾನವನ್ನು ನೀಡಿ ಗೌರವಿಸಿದೆ. ಪ್ರಾಚೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯದಲ್ಲಿ ಚಂಪೂ, ವಚನ, ರಗಳೆ, ಷಟ್ಪದಿ, ಸಾಂಗತ್ಯ, ಕೀರ್ತನೆ, ತ್ರಿಪದಿ ತತ್ವಪದ ಮೊದಲಾದ ವೈವಿಧ್ಯಮಯವಾದ ಸಾಹಿತ್ಯ ಪ್ರಕಾರಗಳು ಸೃಷ್ಟಿಯಾಗಿವೆ. ಹೊಸಗನ್ನಡ ಕಾಲಘಟ್ಟದಲ್ಲಿ ನವೋದಯ, ಪ್ರಗತಿಶೀಲ, ನಮ್ಮ ಬಂಡಾಯ, ದಲಿತ ಸಾಹಿತ್ಯ ಚಿಂತನೆಗಳು ಹುಲುಸಾಗಿ ಬೆಳೆದಿವೆ. ಇವು ನಾಡಿನ ಸಾಂಸ್ಕೃತಿಕ ಚರಿತ್ರೆಯನ್ನು ಕಟ್ಟಿಕೊಡುತ್ತವೆ. ಮುಂದಿನ ಜನಾಂಗ ಕನ್ನಡ ನಾಡು-ನುಡಿಯ, ಸಂಸ್ಕೃತಿಯ ಚಿಂತನೆಯೊಂದಿಗೆ ಸಂವೇದನಾಶೀಲವಾದ ವ್ಯಕ್ತಿತ್ವವನ್ನು ರೂಪಿಸಿಕೊಳ್ಳಲು ಕನ್ನಡ ಸಾಹಿತ್ಯ ಅಧ್ಯಯನದ ಅಗತ್ಯವಿದೆ.</p>	
<p><b>ಕಾರ್ಯಕ್ರಮದ ನಿರ್ದಿಷ್ಟ ಫಲಿತಾಂಶಗಳು : (PSO 2)</b></p> <ul style="list-style-type: none"> <li>➤ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ವಿವಿಧ ಕಾಲಘಟ್ಟಗಳ ಸಾಹಿತ್ಯ ಪ್ರಕಾರಗಳ ಸಮಗ್ರವಾದ ಜ್ಞಾನವನ್ನು ಹೊಂದಿರುವುದು</li> <li>➤ ನಾಡು-ನುಡಿಯ ಕುರಿತಾದ ಐತಿಹಾಸಿಕ ಪ್ರಜ್ಞೆ, ತಿಳಿವಳಿಕೆಯ ಮೂಲಕ ಸಮಕಾಲೀನ ಸಮಸ್ಯೆಗಳನ್ನು ಅರ್ಥೈಸಬಲ್ಲ ಜಾಣ್ಮೆಯನ್ನು ಬೆಳೆಸಿಕೊಂಡಿರುವುದು</li> <li>➤ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ, ಛಂದಸ್ಸು, ವ್ಯಾಕರಣ, ಭಾಷಾವಿಜ್ಞಾನ, ಕಾವ್ಯಮೀಮಾಂಸೆಗಳ ಜ್ಞಾನಗಳನ್ನು ಸ್ಪರ್ಧಾತ್ಮಕ ಪರೀಕ್ಷೆಗಳಿಗೆ ಅನ್ವಯಿಸಿಕೊಳ್ಳುವ ಕೌಶಲ ಬೆಳೆಸಿಕೊಂಡಿರುವುದು</li> <li>➤ ಸಾಹಿತ್ಯದ ಓದಿನ ಮೂಲಕ ಸಂವೇದನೆಗಳನ್ನು ಸೂಕ್ಷ್ಮಗೊಳಿಸಿಕೊಳ್ಳುವ ಹಾಗೂ ಚಿಂತನೆಗಳನ್ನು ಹರಿತಗೊಳಿಸಿಕೊಳ್ಳುವ ಸಾಮರ್ಥ್ಯವನ್ನು ಕರಗತ ಮಾಡಿಕೊಂಡಿರುವುದು</li> <li>➤ ಕಾವ್ಯ, ಕಥೆ, ವಿಮರ್ಶೆ, ಹರಟೆ, ಚುಟುಕು, ಹಾಸ್ಯ ಬರಹಗಳು, ನುಡಿಚಿತ್ರ ಮೊದಲಾದವುಗಳನ್ನು ರಚಿಸಬಲ್ಲ ಸೃಜನಶೀಲತೆಯನ್ನು ಬೆಳೆಸಿಕೊಂಡಿರುವುದು I</li> <li>➤ ಸ್ಪರ್ಧಾತ್ಮಕ ಪರೀಕ್ಷೆಗಳಿಗೆ ಬೇಕಾದ ಜ್ಞಾನ ಕೌಶಲಗಳನ್ನು ಬೆಳೆಸಿಕೊಂಡಿರುವುದು</li> </ul>	

### ಪದವಿಯ ಫಲಿತಾಂಶಗಳು (COs)

- ಹೊಸಗನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆಯ ಸ್ವ ರೂಪ, ಲಕ್ಷಣ, ವ್ಯಾಪ್ತಿಮೊದಲಾದ ಅರಿವನ್ನು ಬೆಳೆಸಿ ಹೊಸಗನ್ನಡಕಾವ್ಯ, ನಾಟಕಗಳನ್ನು ಓದುವ, ವಿಶ್ಲೇಷಿಸುವ, ವಿಮರ್ಶಿಸುವ ಜ್ಞಾನ ಗಳಿಸಿಕೊಂಡಿರುವುದು
- ನಡುಗನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆಯ ಸ್ವರೂಪ, ಲಕ್ಷಣ, ವ್ಯಾಪ್ತಿ ಮೊದಲಾದ ಅರಿವನ್ನು ಬೆಳೆಸಿಕೊಂಡಿರುವುದು
- ನಡುಗನ್ನಡ ಕಾವ್ಯ ಪ್ರಕಾರಗಳ ಸ್ವರೂಪ, ಲಕ್ಷಣಗಳನ್ನು, ವಸ್ತು ವೈವಿಧ್ಯವನ್ನು ಪರಿಚಯ ಮಾಡಿಕೊಂಡಿರುವುದು
- ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿಯ ಸ್ವರೂಪ, ಲಕ್ಷಣಗಳ ಜ್ಞಾನವನ್ನು ಪಡೆದುಕೊಂಡಿರುವುದು
- ಕನ್ನಡ ಭಂದಸ್ಸಿನ ಚರಿತ್ರೆ ಹಾಗೂ ವಿವಿಧ ಪ್ರಕಾರಗಳು, ಅವುಗಳ ಲಕ್ಷಣಗಳ ಅರಿವು ಮೂಡಿಸಿಕೊಂಡಿರುವುದು
- ನಡುಗನ್ನಡ ಹಾಗೂ ಹಳಗನ್ನಡ ಪದ್ಯಗಳಿಗೆ ಪ್ರಸ್ತಾರ ಹಾಕುವ, ಭಂದಸ್ಸನ್ನು ಕಂಡುಕೊಳ್ಳುವ ಕೌಶಲವನ್ನು ಬೆಳೆಸಿಕೊಂಡಿರುವುದು
- ಜನಪದ ಸಾಹಿತ್ಯದ ಸ್ವ ರೂಪ, ಲಕ್ಷಣಗಳ ಅರಿವು, ಜನಪದ ಸಾಹಿತ್ಯ ಪ್ರಕಾರಗಳು, ವಿವಿಧ ಜನಪದ ಕಲಾ ಪ್ರಕಾರಗಳು, ಜನಪದ ರಂಗಭೂಮಿ, ಜನಪದ ದೈವಗಳು, ಜನಪದ ಕ್ರೀಡೆಗಳು ಮೊದಲಾದ ವಿಚಾರಗಳ ಕುರಿತು ಸ್ಪಷ್ಟವಾದ ಅರಿವು ಹೊಂದಿರುವುದು
- ಪ್ರಾಚೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆಯ ಅರಿವನ್ನು ಹೊಂದಿರುವುದು
- ಶಾಸನ ಸಾಹಿತ್ಯ ಅವುಗಳ ಸ್ವ ರೂಪ, ಲಕ್ಷಣಗಳು ಹಾಗೂ ಅವುಗಳ ಐತಿಹಾಸಿಕತೆ ಇವುಗಳ ಅರಿವು ಮೂಡಿಸಿಕೊಂಡಿರುವುದು
- ಹಳಗನ್ನಡ ಚಂಪೂ ಕಾವ್ಯದ ಓದು, ವ್ಯಾಖ್ಯಾನಗಳ ಅರಿವು ಮೂಡಿಸಿಕೊಂಡಿರುವುದು
- ಕನ್ನಡ ವ್ಯಾಕರಣ ಪರಿಚಯ ಮಾಡಿಕೊಂಡಿರುವುದು ಹಾಗೂ ಅದನ್ನು ಇಂದಿನ ಸಂವಹನದಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಲ್ಲ ಕೌಶಲ ಪಡೆದುಕೊಂಡಿರುವುದು
- ಕನ್ನಡ ಸಂಶೋಧನೆಯ ಇತಿಹಾಸ, ಸ್ವರೂಪ, ಪ್ರಕಾರಗಳು, ವಿವಿಧ ಹಂತಗಳು ಹಾಗೂ ಸಂಶೋಧನೆ ಬರಹಗಳ ಸ್ಪಷ್ಟವಾದ ಅರಿವನ್ನು ಹೊಂದಿರುವುದು
- ವಿವಿಧ ಸಾಹಿತ್ಯ ಜ್ಞಾನದೊಂದಿಗೆ ಕನ್ನಡದಲ್ಲಿ ಸ್ಪರ್ಧಾತ್ಮಕ ಪರೀಕ್ಷೆಗಳನ್ನು ಎದುರಿಸಬಲ್ಲ ಶಿಸ್ತನ್ನು ಮೈಗೂಡಿಸಿಕೊಂಡಿರುವುದು

<b>Department Name:</b>	<b>HINDI</b>
<b>PROGRAMME OUTCOMES</b>	

PO1: To enhance their knowledge in Hindi language, grammar & prose were prescribed in the syllabus, to develop basic language skills in reading and writing among students.

PO2: To make the syllabus more job oriented and to promote multi-lingual and inter-disciplinary study, Translation has been included in the syllabus.

PO3: Functional Hindi has been introduced to make the syllabus more relevant for industry, bank and other public/private sectors.

PO4: To develop a range of artistic skills among the students drama has been added into the syllabus.

PO5: To develop spirituality, moral & social values, Modern poetry has been introduced.

PO6: To develop effective communication skills, peer teaching-learning, Seminars, projects, assignments, and industry visit has been made as a part of the regular curriculum.

PO7: Knowledge of literary isms and Indian culture.

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO 1: Students will improve their reading and interpreting skills by introducing them to texts on specific social, economic, cultural, political issues. Such texts through their contemporaneity will contextualize language and help students to think critically and articulate their thoughts in classroom discussions.

PSO2: They will learn to communicate with teachers, their peers and other with speakers in public domain using Hindi language. They will be able to read and comprehend reference materials related to core subjects of their discipline. They should be able to read Hindi language newspapers and also understand Hindi language content available on television and also social media platforms

PSO3: Students should also be able to distinguish between formal, colloquial, journalistic, poetic, scientific forms and registers of language.

#### **Course Outcomes:**

CO1: Multicultural and multi lingual approach.
CO2: Students undergoing the program will improve their basic Hindi language skills like reading, listening, comprehending, speaking, debating and writing
CO3: Learners will gain confidence to use an national language and become competent global citizens in an age of globalization
CO4: reading competence through engagement with challenging texts of selected prose,poetry and short stories
CO5: logical thinking, analytical skills and critical thinking abilities through such engagement
CO6: Conversation skills through Dialogue Writing
CO7: Logical thinking through completing a story by following guiding hints
CO8: Metaphorical use of language through Idioms and Phrases
CO9: Using appropriate Articles and Prepositions
CO10: Vocabulary building / semantics / etymology
CO11 : Skills of paraphrasing by practice of Precise Writing
CO12 : Appropriate use of collocations, Phrasal verbs and Tense forms

Department Name:	SANSKRITH
<b>PROGRAMME OUTCOMES</b>	
PO1:Attain greater understanding of different areas of Sanskrit Language, Literature and Shastras.	
PO2: Acquire high proficiency and knowledge in a particular subfield of Sanskrit Studies.	
PO3:Understand the traditional and contemporary ways for dealing with Sanskrit Literature, Language and Shastras .	
CO4:Understand and articulate issues pertaining to origin and evolution of Sanskrit Language ,Literature.	
CO5:Understand the advanced and the scientific Structure of Sanskrit Grammar.	
CO6:Impart the knowledge of Sanskrit Literature as based on Values of Ethics and Morality capable of providing right grooming.	
CO7:Impart knowledge of comparative linguistic methodology.	
CO8:Acquire Sanskrit language skills to read, write, speak and translate .	

<b>PROGRAMME SPECIFIC OUTCOMES</b>	
<p>PSO 1: Students will improve their reading and interpreting skills by introducing them to texts on specific social, economic, cultural, political issues. Such texts through their contemporaneity will contextualize language and help students to think critically and articulate their thoughts in classroom discussions.</p> <p>PSO2: They will learn to communicate with teachers, their peers and other with speakers in public domain using Hindi language. They will be able to read and comprehend reference materials related to core subjects of their discipline. They should be able to read Hindi language newspapers and also understand Hindi language content available on television and also social media platforms</p> <p>PSO3: Students should also be able to distinguish between formal, colloquial, journalistic, poetic, scientific forms and registers of language.</p>	
<b>Course Outcomes:</b>	
<p>CO1: Logical thinking through completing a story by following guiding hints</p> <p>CO2: Metaphorical use of language through Idioms and Phrases</p> <p>CO3: Using appropriate Articles and Prepositions</p> <p>CO4: Vocabulary building / semantics / etymology</p> <p>CO5: Skills of paraphrasing by practice of Precise Writing</p> <p>CO6: Appropriate use of collocations, Phrasal verbs and Tense forms</p>	

<b>Department Name:</b>	<b>MALAYALAM</b>
<b>PROGRAMME OUTCOMES</b>	
<p>PO1: To ground all students in the four basic language skills of speaking, listening, reading and writing</p> <p>PO2: To hone their powers of comprehension, analysis and expression in Malayalam language</p> <p>PO3: To draw out creativity and originality</p> <p>PO4: To develop skills in public speaking, leadership and the histrionic arts</p> <p>PO5: To shape their reading habits and make them well-informed young people</p> <p>PO6: To fit them out for careers at the local, national and global levels in the academics, the</p>	

media, the corporate world and the administrative services

#### **PROGRAMME SPECIFIC OUTCOMES**

PSO 1 Students undergoing the course will improve their basic Malayalam skills like reading, listening, comprehending, speaking, debating and writing

PSO2: Multicultural and multi lingual approach will be strengthened

PSO3: Students will improve their reading and interpreting skills by introducing them to texts on specific social, economic, cultural, political issues. Such texts through their contemporaneity will contextualize language and help students to think critically and articulate their thoughts in classroom discussions.

PSO4: Learners will learn to communicate with teachers, their peers and others, and will be able to present themselves as orators in public domain using Malayalam.

PSO5 : Students will also be able to distinguish between formal, colloquial, journalistic, poetic, scientific forms of language..

#### **Course Outcomes:**

CO1: Information can be obtained from the initial level of Malayalam language to the present changing forms

CO2: Along with the theoretical form of the language, the practical form can also be known.

CO3: Enhance the knowledge towards linguistics.

CO4: Sentimental understanding, ethics, social harmony, environmental topics through Indian literature.

CO5: Will be capable of serious, critical and independent reflection.

CO6: Information can be obtained from the initial level of Malayalam language to the present changing forms

CO7: Along with the theoretical form of the language, the practical form can also be known.

CO8: Enhance the knowledge towards linguistics.

CO9: Sentimental understanding, ethics, social harmony, environmental topics through Indian literature.

CO10: Will be capable of serious, critical and independent reflection.

<b>Department Name:</b>	<b>KONKANI</b>
<b>PROGRAMME OUTCOMES</b>	
PO1: The Konkani dept strives to fulfill the following objectives keeping in mind the vision and mission of the college.  PO2: Value based stories help developing moral and ethical dimension.  PO3: Essays help the students to widen their view to creative writing.	
<b>PROGRAMME SPECIFIC OUTCOMES</b>	
PSO 1Students undergoing the course will improve their basic Konkani skills like reading, listening, comprehending, speaking, debating and writing  PSO2: Multicultural and multi lingual approach will be strengthened  PSO3: Learners will learn to communicate with teachers, their peers and others, and will be able to present themselves as orators in public domain using konkani.	