Department of Zoology

Programme Outcomes (PO)

After the completion of B.Sc. Honours Degree Programme, the students will be able to achieve the following outcomes:

PO1: Professional knowledge: Acquire comprehensive knowledge of major concepts, theoretical principles and experimental findings of various subjects in pure sciences.

PO2: Critical thinking and Cognitive skills: Convey the intricate science information effectively and efficiently, analyze and solve the problems related to plants, animal sciences without relying on assumptions and guesses.

PO3: Environment and sustainability: Understand the impact of the scientific solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO4: Effective Communication: Demonstrate familiarity with and will be able to analyze both verbally and in writing issues and forms of contemporary art with a clear understanding of historical precedents.

PO5: Instruments and Experiments: Acquire the skills in handling scientific instruments, planning and performing in laboratory experiments and drawing logical inferences from the scientific experiments.

PO6: Research and Analysis: Demonstrate analytical skill and proficiency in a range of tools and techniques used in research in science and interdisciplinary programmes.

PO7: Employability and higher Education: Show proficiency in professional, employability and develop soft skills required for higher education and placements.

PO8: Ethics: Imbibe ethical, moral and social values in personal and social life leading to highly cultured and civilized personality in the field of science.

PO9: Science and Society: Apply reasoning acquired by the scientific knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional science practice.

PO10: Interdisciplinary Learning: Integrate academic curriculum with other co-curricular goals, such as career development, life-long learning, develop interdisciplinary learning and opportunity to extend their knowledge across all disciplines.

PO11: Nation Building: Introspect and evolve into dynamic and creative individuals capable of socially productive, constructive actions that positively impact our Nation and the World at large.

Programme Specific Outcomes (PSO)

After the completion of B.Sc. Honours Degree Programme, the student will be able to:

PSO1. Identify, classify and differentiate diverse chordates and non-chordates based on their morphological, anatomical and systemic organization.

PSO2. Describe economic, ecological and medical significance of various animals in human life. This will create a curiosity and awareness among them to explore the animal diversity and take up wild life photography or wild life exploration as a career option. The knowledge about identifying and classifying animals will provide student professional advantages in teaching, research and taxonomist jobs in various government organizations; including Zoological Survey of India and National Parks/Sanctuaries.

PSO3. Acquire practical skills in cell & molecular biology, biochemistry, genetics, enzymology These methodologies will provide an extra edge to our students, who wish to undertake higher studies.

PSO4. Understand comparative anatomy and developmental biology of various biological systems; and learning about the organisation, functions, strength and weaknesses of various systems will let student critically analyse the way evolution has shaped these traits in human body.

PSO5. Skill enhancement course like medical diagnostics will provide them opportunity to work in diagnostic or research laboratory.

PSO6. Student undertaking wild life management courses would gain expertise in identifying key factors of wild life management and be aware about different techniques of estimating, remote sensing and Global Positioning of wild life. This course will motivate student to pursue career in the field of wildlife conservation and management.

PSO7: Acquire awareness towards gender, environment, sustainability, human values, and professional ethics and understand the difference between acting, responding, reacting to various social issues.

SEMESTER – I

ZOO CC101 : Non-Chordates I : Protists To Pseudocoelomates

Course Outcome:

On completion of the course student will be able to:

CO1- Learn & interpret the importance of taxonomy and classify Protista, Parazoa, Metazoa, Porifera, Cnidaria, Platyhelminthes and Nemathelminthes.

CO2- Understand and explain the economic importance and describe the life cycle and pathogenecity of P. vivax, E. histolytica, Schistosoma haematobium, Taenia solium, Ascaris lumbricoides and Wuchereria bancrofti.

CO3- Appreciate the diversity and complexities exhibited by non-chordates and familiarize with the morphology, anatomy and functioning of different groups of non-chordates.

CO4- Critically analyze the organization, complexity and adaptations in parasitic Nemathelminthes and Platyhelminthes; affinities and Evolutionary significance of Ctenophora and to enhance collaborative learning through practical sessions, assignments and projects.

Semester I

ZOO CC102 : Principles of Ecology

Course Outcome:

On completion of the course student will be able:

CO1- Understand and relate the key concepts in ecology with emphasis on historical perspective, role of physical factors and concept of limiting factors.

CO2- Understand and explain the population attributes; population growth models and population interactions and to understand and describe the community characteristics and ecological succession.

CO3- Understand and describe the different ecosystems, food chains, energy flow & efficiency; biogeochemical cycles.

CO4- Learn and relate the application of the basic principles of ecology in wildlife conservation and management.

SEMESTER – II

ZOO CC203 : Non-chordates II: Coelomates

Course Outcome:

On completion of the course student will be able to:

CO1- Classify and compare phylum Annelida, Arthropoda, Mollusca and Echinodermata.

CO2 Understand and describe Excretion in Annelida; Vision and Respiration in Arthropoda; Metamorphosis in Insects; Social life in bees and termites.

CO3- Understand and describe Respiration in Mollusca; Torsion and detorsion in Gastropoda; Pearl formation in bivalves.

CO4- Understand and describe the Water-vascular system in Asteroidea; Larval forms in Echinodermata.

SEMESTER – II

ZOO CC204 : Cell Biology

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO 1- Understand the structures and purposes of basic components of Prokaryotic and Eukaryotic cells.

CO2- Understand the structures and functions of Plasma Membrane, Endomembrane System and Cytoskeleton.

CO3- Understand the detailed structure of Mitochondria and how energy is produced by it through the Respiratory chain.

CO4- Understand the detailed structure of Nucleus and its associated structures, Cell Division, Cell Cycle and Cell Signaling.

ZOO GE101 : Animal Diversity

(Theory :4 credits + Practical: 2 credits)

On completion of the course student will be able to:

CO1- Understand and describe the features of Protista, Porifera, Radiata, Acoelomates and Pseudocoelomates.

CO2 - Understand and describe the features of Arthropoda, Mollusca and coelomate deuterostomes.

CO3- Understand and describe the features of Protochordates, Pisces and Amphibia.

CO4- Understand and describe the features of Reptiles, Aves and Mammalia.

SEMESTER – II

ZOO GE202 : Environment and Public Health

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the courses student will be able to:

CO1- Acquire knowledge about various sources of environmental hazards, their risk assessment, fate of toxic and persistent substances in the environment.

CO2- Understand the factors of Climate change like Greenhouse gases, Global warming, Acid rain, Ozone layer destruction and Effect of Climate change on public health.

CO3- Know about the sources and effects of Air, Water and Noise Pollution and their control methods, Waste Management Technologies, Bhopal Gas Tragedy, Chernobyl Disaster, Seveso Disaster and Three Mile Island Accident and their aftermath.

CO4- Understand the causes, symptoms and control of Diseases like- Tuberculosis, Asthma, Silicosis, Asbestosis, Cholera, Minamata, Arsenicosis and Fluorosis.

SEMESTER – III

ZOO CC305 : Diversity of Chordates

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the courses student will be able to:

CO1- Understand the General Characteristics and Classification of Hemichordata, Urochordata and Cephalochordata, the Larval forms of Protochordata and Retrogressive Metamorphosis in Urochordata.

CO2- Acquire knowledge about the General Characters and Classification of Agnatha, Pisces and Amphibia.

CO3- Understand the General Characteristics and Classification of Reptilia, Aves and Mammals, Biting Mechanism in Snakes, Flight Adaptations in Birds and Migration in Birds.

CO4- Know about the Zoogeographical Realms and Characteristic Fauna.

SEMESTER – III

ZOO CC306 : Animal Physiology: Controlling and Coordinating Systems

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the courses student will be able to:

CO1- Know about different types of Tissues, Bone and Cartilage, Muscles and physiology of Muscle Contraction.

CO2- Acquire knowledge about the structure and function of Nervous System.

CO3- Understand the Histology and physiology of Male and Female Reproductive System.

CO4- Learn about the Histology and Physiology of human Endocrine System and Associated Diseases.

SEMESTER – III

ZOO CC307 : Fundamentals of Biochemistry

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Understand the Structure, Classification and Importance of Carbohydrates and Proteins.

CO2- Understand the Structure and Significance of physiologically important Lipids.

CO3- Understand the Basic Structure and Types of DNA and RNA, Base pairing, Denaturation and Renaturation of DNA.

CO4- Understand the Types of Enzymes, Mechanism of Enzyme Action and Enzyme Kinetics

SEMESTER – IV

ZOO CC408 : Comparative Anatomy of vertebrates

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Describe the function and derivative of integument

CO2- Explain the Evolution of heart and aortic arches

CO3- Compare structure and function of the Alimentary canal and associated glands

CO4- Evaluate the techniques relating to the nervous system and how they within the body respond to challenges.

SEMESTER – IV

ZOO CC409 : Animal Physiology: Life Sustaining Systems

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Compare the mechanical and chemical digestion of food

CO2- Remember and understand hormonal control of secretion of enzymes in gastrointestinal tract

CO3- Acquire knowledge of mechanism of breathing, Pulmonary ventilation and its control and to understand the concept of hemostasis and blood clotting system.

CO4- Explain origin and conduction of cardiac impulses and cardiac cycles.

SEMESTER – IV

ZOO CC410 : Biochemistry of Metabolic Processes

(Theory :4 credits + Practical: 2 credits)

Course outcome:

ZOOCC 410: Biochemistry of Metabolic Processes

On completion of the course student will be able to:

CO1- Compare catabolism Vs Anabolism, Compartmentalization of metabolic pathways and membrane transporters

CO2- Construct a flowchart for the steps involved in sequence of reactions of glycolysis, citric acid and pentose phosphate pathway

CO3- Acquire a comprehensive knowledge of β – oxidation of saturated fatty acids

CO4- Understand the transamination and determination.

ZOO CC511 : Molecular Biology

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Understand Central dogma of molecular biology. Explain and distinguish mechanism of replication, transcription and translation in prokaryotes and eukaryote

CO2- Understand and explain the post transcriptional modifications in eukaryotes.

CO3- Explain and differentiate the mechanism of gene expression and regulation in prokaryotes and eukaryotes

CO4- Describe the concept of regulatory RNAs, Ribo-switches and RNA interference and to enhance skill in molecular biology through relevant experiments.

ZOO CC512 : Principles of Genetics

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Explain and discuss the genetic variation through linkage and crossing over.

CO2- Describe sex-linked, sex limited and sex influenced inheritance.

CO3- Understand the Concept behind genetic disorder, gene mutations and molecular basis of mutations and to explain the criteria for extra-chromosomal inheritance.

CO4- Describe the molecular mechanisms of recombination in bacteria and to explain and distinguish the concept of transposable genetic elements in prokaryotes and eukaryotes. Solve genetic based problems.

ZOO CC613 : Developmental Biology

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Describe the mechanism of gametogenesis, fertilization and blocks to polyspermy.

CO2- Explain early embryonic development in frog and chick.

CO3- Understand the concepts of late embryonic development in model organisms.

CO4 - Describe post embryonic development such as metamorphosis and regeneration with suitable examples and apply important experiments and project work.

SEMESTER – II

ZOO CC614 : Evolutionary Biology

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the courses student will be able to:

CO1- Understand the basis of origin of life such as: chemogeny, RNA world, biogeny and evolution of eukaryotes.

CO2- Obtain the various evolutionary concepts and heritable variation and to understand concept of species, isolating mechanisms, modes of speciation and adaptive radiation.

CO3- Explain and different types of fossils, geological time scale, climatic conditions, hominid characteristics, primate phylogeny and evolution of horse and man.

CO4- Understand Hardy-Weinberg principle of genetic equilibrium and its destabilizing forces such as Natural selection, Mutation, Migration and genetic drift.

ZOO GE303 : Food, Nutrition and Health

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the courses student will be able to:

CO1- Explain the concept of balanced diet.

CO2- Compare nutrient needs and dietary pattern for various groups – adults, pregnant and nursing mothers.

CO3- Understand the concept of Carbohydrate, lipids and proteins.

CO4- Apply the knowledge of potable water and apply to methods of purification at domestic level.

SEMESTER – IV

ZOO GE404 : Insect Vectors and Diseases

(Theory :4 credits + Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Understand and describe the morphological features of insects

CO2- Understand the exemplify the important insect Vectors- mosquitoes, Sand fly and houseflies

CO3- Understand and Explain mosquito-borne diseases live Malaria, Dengue, hikungunya, Viral encephalitis

CO4- Understand and describe the Hemipteran disease vectors

SEMESTER – V

ZOO DSE501 : Endocrinology

(Theory :4 credits+ Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Describe and of types of endocrine glands, classify hormones and explain their features.

CO2- Explain structure, functions and regulation of peripheral endocrine glands and associate function of neuroendocrine system, epiphysis, and hypothalamo-hypophysial axis.

CO3- Understand the mechanism of regulation of hormone action hormone action at cellular level and gain the knowledge of hormone receptors.

CO4- Apply the knowledge by performing biochemical assays to detect level of hormones in plasma and visualize cross sections of endocrine glands.

ZOO DSE502 : Immunology

(Theory :4 credits+ Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Explain cells and organs of the immune system, innate and adaptive immunity.

CO2- Describe autoimmunity with reference to rheumatoid arthritis and tolerance and AIDS.

CO3- Understand antigens and its type, structure and functions of immunoglobulins, ntigen-antibody interactions and immunoassays (such as ELISA and RIA).

CO4- Explain structure and functions major histocompatibility complex, know the concept of hypersensitivity and vaccines.

SEMESTER – VI

ZOO DSE603 : Animal Behavior and Chronobiology

(Theory :4 credits+ Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Understand various pattern of animal behaviours such as stereotyped, instinct, learnt, associative behaviour along with operant conditioning and habituation imprinting and to explain the concept of social and sexual behaviour.

CO2- Provide the concept of biological rhythm, photoperiod and regulation of seasonal reproduction of vertebrates and role of melatonin.

CO3- Understand the relevance of biological clock in terms of chronopharmacology, chronomedicine and chronotherapy.

CO4- Develop the skill in this course by performing practical works such as studying nest and nesting habitat of birds and social insects and other significant experiments.

SEMESTER – VI

ZOO DSE604 : Wild Life Conservation and Management

(Theory :4 credits+ Practical: 2 credits)

Course outcome:

On completion of the course student will be able to:

CO1- Understand different physical and biological parameters for evaluation and management of wild life.

CO2- Get the knowledge of Grazing logging, cover construction, preservation of genetic diversity and restoration of degraded habitats under management of habitats.

CO3- Estimate Population density, Natality, Birth rate, Mortality and fertility schedules.

CO4- Get the concept of climax persistence, Rescue and rehabilitation, Quarantine, Common disease of wild animal and Man – Animal conflict and to enhance exposure through visit to Wild life Sanctuary, Biodiversity Park and Zoological Parks .

SEMESTER – IV

ZOO SEC402 : Medical Diagnostics (2 credits)

Course Outcome:

On completion of the courses student will be able to:

CO1- Explain medical diagnostics and its importance.

CO2- Understand concept of diagnostics methods used for analysis of blood and urine.

CO3- Describe distinguish infectious diseases and non-infectious diseases, its causes, types, symptoms, complications, diagnosis and preventions.

CO4- Describe and distinguish tumour, its types. Explain methods of detection such as medical imaging: X-ray of bone fracture, PET, MRI and CT Scan (using photographs).

Semester I

ENG AEC101: English Communication

Course Outcomes:

After Completion of the course, student will be able to:-

CO1: Communicate effectively using the techniques in the area of spoken as well as written communication

CO2: Hone their LSRW skills within their communication.

CO3: Design and answer job interview questions

CO4: Demonstrate the ability to craft professional messages that are clear yet courteous

SEMESTER – I

HINAECC101 – हिन्दी-व्याकरण और सम्प्रेषण

परिणाम:

1. विभिन्न प्रतियोगी परीक्षाओं के लिए तैयार करना।
2. सम्प्रेषण-क्षमता की वृद्धि करना।
3. कार्यालयी-पत्र लेखन की क्षमता विकसित करना।
4. हिन्दी के व्याकरणिक एवं सैद्धांतिक स्वरूप की जानकारी हासिल करना।

Semester II

ENG AEC202: Environmental Science

Course Outcomes:

After Completion of the course, student will be able to:-

CO1: Understand multi disciplinary nature of environmental studies

CO2: Understand the concept and types of natural resources and environmental pollution.

CO3: Evaluate the anomalies created due to haphazard population growth and its impact on environment

CO4: Understand about the organisations, convention and legislations working on mitigation of environmental issues.

Semester III

IRS SEC301 : Inter-Religious Studies

Course Outcomes:

After completion of the course, the students will be able to:

CO1: Develop Inter-religious harmony & better understanding of other religions.

CO2: Interpret the different religions of the world.

CO3: Identify the common elements that bind different religions together.

CO4: Acquaint with the salient features of different religions.

PROGRAM: BACHELOR OF COMMERCE (B.COM.)

PROGRAM OUTCOMES

After completing the programme, the B.Com graduate will be able to:

PO 1: Acquire the sills of business, legal, statistical, financial, entrepreneurial, information technology and analytical expertise.

PO 2: Apply the managerial skills, abilities and knowledge in a business organization, and be capable of maintaining business accounts.

PO 3: Develop effective communication skills to handle organizational transactions between individuals, business correspondence and enhance the organizational picture.

PO 4: Participate effectively in social, commercial and civic issues ultimately leading to national development.

PO 5: Understand how to operate a business successfully in a continuously changing environment.

PO 6: Develop an entrepreneurship spirit and participate effectively in social, commercial and civic issues ultimately leading to national development.

PO 7: Make effective use of skills and talents as entrepreneurs or employees.

PROGRAM SPECIFIC OUTCOMES

Program Specific Outcomes for B.COM. in Accounting

After completing the programme, a B.Com graduate specializing in Accounting will be able to:

PSO 1: Apply financial accounting, advanced accounting, managerial accounting, career skills, both quantitative and qualitative knowledge to their future careers in business.

PSO 2: Gain the knowledge about the various provisions of Income Tax Act 1961 and GST and its applicability.

PSO 3: Gain knowledge about various concepts and skills to prepare accounts related to the government organisation.

PSO 4: Gain proficiency to answer professional exams like CA, CS, ICWA, CMA and other diploma courses such as Tally ERP 9, and MS- Excel.

PSO 5: Gain in-depth knowledge of generally accepted auditing procedures and applicability of techniques in conducting the audit.

PSO 6: Acquire practical skills to work as tax consultant, cost accountant, audit assistant and other financial supporting services.

PSO 7: Acquire skills to prepare and write the books of accounts under hire purchase system, Investment accounting, redemption of debentures and liquidation of companies.

PSO 8: Identify and understand the financial statements prepared on the basis of Generally Accepted Accounting Principles (GAAP) as well as Indian Accounting Standards and as per International Financial Reporting Standards (IFRS)

Program Specific Outcomes for B.COM. in Cost Accounting

After completing the programme, a B.Com graduate specializing in Cost Accounting will be able to:

PSO 1: Understand the basic concepts of cost accounting and elements of cost.

PSO 2: Understand the basic concepts and element of cost - labour cost and overhead.

PSO 3: Understand and use the application of accounting techniques for costing.

PSO 4: Understand and apply various accounting techniques for management.

PSO 5: Familiarised with basic conceptual & working knowledge of various methods of cost accounting

PSO 6: Gain in-depth knowledge of cost and management audit

Program Specific Outcomes for B.COM. in Business Management

After completing the program, a B.Com. graduate specializing in Business Management will be able to:

PSO 1: Understand the basic concepts of International Marketing.

PSO 2: Analyse and apply retail management strategies.

PSO 3: Understand the fundamentals of advertising, media planning and effectiveness of advertising.

PSO 4: Understand the diversity in the services sector and the unique challenges faced by the managers in these services.

PSO 5: Understand the concepts, role and techniques of financial management in firms and apply decision making in management of corporate finance.

PSO 6: Understand the basics of Strategic Management and analyse the various strategies of business firms to have a competitive advantage.

PSO 7: Understand the key concepts and processes of Supply Chain & Logistics Management and apply them to real world scenarios.

Program Specific Outcomes for Economics Department (B.COM.)

On the completion of the B.Com. (Hons.), the students would be able to:

PSO 1: Understand the fundamental economic concepts, principles and theories relating to Managerial and Micro economics, Economics of Resources, Indian Economy, Monetary and International Economics and Banking.

PSO 2: Facilitate the application and analysis of different methods of calculating costs and profits, capital budgeting and evaluate the projects, analysing central and state govt. budgets, measures of money supply and foreign investments and balance of payments.

PSO 3: Evaluate course related data and information with respect to relevant economic issues through appropriate research techniques.

PSO 4: Design different strategies to enable decision makings in public policy.

Program Specific Outcomes for Computer Application Department (B.COM.)

PSO 1: familiarize with essential Information Technology concepts and to acquaint students with knowledge of data capture, presentation and report formatting skills.

PSO 2: imparting skills to analyze business data using spreadsheets and handling business database using DBMS software.

PSO 3: understanding e-commerce scenario for handling business transactions and issues relating to security aspects.

PSO 4: to familiarize students with computer networking concepts and significance of cyber security.

COURSE OUTCOMES

FIRST YEAR BACHELOR OF COMMERCE

Core Course 01: General Management

After completion of the course, learner will be able to:

CO 1: Explain the importance, features, levels and functional areas of management. Analyse different approaches of management.

CO 2: Apply and analyse steps and types of Managerial decisions. Understand rationality and creativity in decision making.

CO 3: Summarise the reasons, feature, types and factors of change. Apply and analyse the steps involved in change management and conflict management.

CO 4: Explore the emerging areas in Management.

Core Course 02: Financial Accounting

After completion of the course, students will be able to:

CO 1: Explain the difference between Single entry system and Double entry system of book keeping and Compute the profit & loss under single entry system.

CO 2: Apply the provisions relating to AS 6 and Compute the provisions for depreciation under different methods.

CO 3: Explain legal provisions relating to issue and buy back of shares and Prepare Journal entries on issue and buy back of shares.

CO 4: Explain the legal provisions relating to redemption of preference shares and Prepare the Journal entries and the balance sheet after redemption.

Core Course 03: Micro Economics

On the completion of the Course the students would be able to:

CO 1: Understand and describe the concepts of Demand, Supply, Marginal and Average Revenue, Indifference Curve, Isoquant and list various short and long run costs of production.

CO 2: Evaluate numerical problems on Elasticity of Demand and cost of production, demand elasticities, impact of costs on revenue and significance of equilibrium price and output in different markets.

CO 3: Classify different Market Structures and analyse price and output under short and long run in these market structures.

CO 4: Compile and construct data for Individual and Market demand and estimate demand, adapt different cost, pricing and production policies in different markets.

Core Course 04: Commercial Arithmetic-I

CO 1: Student will be well equip with the basic conceptual knowledge in mathematics and its application to commerce and industry

CO 2: Student will acquire the required knowledge for economic and economic related activity

Core Course 05: Introduction to Marketing

After completion of the course, learner will be able to:

CO 1: Understand the concept of marketing and kinds of goods.

CO 2: Demonstrate an understanding of market environment, market segmentation. Apply and analyse consumer behaviour and market research.

CO 3: Analyse marketing decisions with respect to marketing mix, physical distribution, warehousing and transportation

CO 4: Explore various recent trends in marketing.

Core Course 06: Financial Statement Analysis and Interpretation

After completion of the course, students will be able to:

CO 1: Prepare Statement of profit & loss and the balance sheet as per Schedule III of Companies Act 2013.

CO 2: Analyse and Interpret the financial statement.

CO 3: Analyse and Interpret the important financial ratio measuring liquidity, solvency and profitability of the companies. Students will able to Explain concept of EVA and Compute the EVA.

CO 4: Explain the concept of cash flow and classification of activity and Prepare the Cash flow statement as per indirect method and IND AS 7.

Core Course 07: Managerial Economics

On the completion of the Course the student would be able to:

CO 1: Describe the concepts of Managerial economics like pricing methods, breakeven analysis, capital budgeting and cost of capital.

CO 2: Apply and analyse the various methods of pricing, kinds of profit, types of projects, sources of funds for financing projects and sources of business risks with mathematical analysis,

CO 3: Evaluate the effectiveness of pricing, profit and investment strategies in different market conditions.

CO 4: Design a pricing, profit and investment strategy.

Core course 08: Commercial Arithmetic-II

CO 1: Learner will acquire the basic knowledge of mathematics and its applications in the field of commerce and industry.

CO 2: Students will learn and understand the wide ranging applications of mathematical techniques to commerce, economics and practical situations.

Ability Enhancement Core Course 01: Spoken English

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

CO 1: Communicate clearly and fluently using the grammatically correct language.

CO 2: Listen to, understand, order, and present facts, ideas, and opinions.

CO 3: Articulate experience and express what is thought, felt, and imagined.

CO 4: Use a register appropriate to the audience and context.

Ability Enhancement Core Course 02: Environmental Studies- I

After completion of the course, students will be able to:

CO 1:. Students are introduced to the multi-dimensional feature of environmental reality.

CO 2. They are familiarized with the plural perspectives on environment both as an academic focus and lived-in reality.

CO 3: Will be able to recognize the physical, chemical, and biological components of the earth's systems and show how they function.:

Ability Enhancement Core Course 03: Business Communication

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

CO 1: Communicate clearly and fluently using the grammatically correct language.

CO 2: Listen to, understand, order, and present facts, ideas, and opinions.

CO 3: Articulate experience and express what is thought, felt, and imagined.

CO 4: Use a register appropriate to the audience and context.

Ability Enhancement Core Course 04: Environmental Studies- II

After completion of the course, students will be able to:

CO 1: Understand the role of humans in environmental damage

CO 2: Assess the need for self -control

CO 3: Understand the various agents of pollution

CO 4: Motivate a change in one's behaviour and think sustainable

Generic Elective 01: Computer Application-I

After completion of the course, students will be able to:

CO 1: Develop Understanding essential IT concepts and emerging technologies.

CO 2 : Understand practical skills with regards data capture, analysis and presentation, report formatting, efficient search techniques and online collaboration tools.

Generic Elective 01: Banking- I

On the completion of the Course the student would be able to:

CO 1: Understand the basic concepts of banking, structure of banking and list the different types of banks, the different banking systems and business of banking in India.

CO 2: To Identify and explain the importance of different types of deposits and lending, principles of lending, procedure involved in opening of deposit accounts.

CO 3: Analyse different types of customers, various accounts and banking operations.

CO 4: Appraise varied retail products in banking and Evaluate significance of Customer Relationship Management in Banking and customer relationship building strategies.

Generic Elective 01: Principles & Practices of Accounting

After completion of the course, students will be able to:

CO 1: Understand the basic accounting concepts and conventions and apply them while recording transactions and events.

CO 2: Explain the qualitative characteristics that will help them to develop the skills in course of time to prepare financial statements.

CO 3: Understand the significance of issuance of Accounting Standards and also apply it while preparing financial statements.

CO 4: Identify contemporary issues in accounting such as Price Level changes Accounting, Human Resource Accounting, Environmental Accounting & CSR.

Generic Elective 01: Marketing Management

After completion of the course, students will be able to:

CO 1: Understand basic concepts of marketing.

CO 2: Explain concept of marketing mix elements.

CO 3: Apply the theoretical marketing concepts to the practical situations.

Generic Elective 02: Computer Application-II

After completion of the course, students will be able to:

CO 1: To familiarize with computer networking concepts, e-commerce technology and related business applications.

CO 2: Understand principles of cyber security and cyber laws in order to adopt safe practices while transacting online.

Generic Elective 02: Banking- II

On the completion of the Course the student would be able to:

CO 1: Define Banker Customer relationship, Special features of banker-customer, banking technology.

CO 2: List Assets and Liabilities of a Bank, Revenue and Expense of a Bank and construct Financial Statements of banks and find the performance ratios.

CO 3: Analyse conventional and modern methods of fund transfer, banking payment intermediaries, emerging trends in banking communication

CO 4: Assess the Reforms in banking sector and classify negotiable instruments.

Generic Elective 02: Tourism and Hospitality Management

After completion of the course, students will be able to:

CO 1: Understand the concept of tourism, and basic terminologies used in tourism industry.

CO 2: Explain different types and forms of tourism. Students will also be able to understand the constituents of tourism industry.

CO 3: Evaluate about the different stakeholders and relevant agencies in the tourism industry and how these stakeholder plays their functions.

CO 4: Identify employment opportunities in various sectors of hospitality industry.

Generic Elective 02: Service Marketing- I

After completion of the course, students will be able to:

CO 1: Understand basic concepts of Services marketing.

CO 2: Explain concept of Service marketing mix elements.

CO 3: understand consumer perception / satisfaction towards services.

SECOND YEAR BACHELOR OF COMMERCE

Core Course 09: Business Finance

After completing the course, the student will be able to:

CO 1: Gain knowledge on various aspects of business finance.

CO 2: Understand the basics of finance and develop a financial plan of the same for an organization.

CO 3: Learn how to classify capital and understand different concepts of capital.

CO 4: Acquaint themselves with the theories of capitalization and identify causes, effects and remedies of overcapitalization and undercapitalization.

CO 5: Determine the amount of capital required using the theories of capitalization.

CO 6: Understand the various aspects of capital structure.

Core Course 10: Fundamentals of Cost Accounting

After completion of the course, students will be able to:

CO 1: Explain the concepts cost, terminologies and classifications.

CO 2: Explain the accounting for material losses. Students will also enable to Prepare the cost sheet and estimated cost sheet and Compute the total cost and cost per unit.

CO 3: Explain and Apply different terminologies in contract costing and Prepare the contract accounts of the contractor.

CO 4: Explain and Apply the different terminologies in Process costing and Prepare the process accounts and also Compute the cost of Joint products and By products.

Core Course 11: Entrepreneurship Development

After completion of the course, students will be able to:

CO 1: Understand basic concepts in entrepreneurship development.

CO 2: Identify and correlate environmental factors affecting business.

CO 3: Understand the creative process of opportunity identification and screening.

CO 4: Design a project proposal.

CO 5: Understand role of incubation centres and principles of innovation.

Core Course 12: Fundamentals of Investment

After completing the course, the student will be able to:

CO 1: Describe the general structure of financial market.

CO 2: Understand the investment environment and different investment options available.

CO 3: Get acquainted with the framework of analysis such as fundamental and technical analysis for investment.

CO 4: Take investment decisions considering risk-return trade-off for each of the investment alternative.

CO 5: Acquire knowledge about the agencies set up for investor protection grievances and redressal system

Core Course 13: Income Tax

After completion of the course, students will be able to:

CO 1: Explain the concepts in income tax and Apply the provisions with respect to Residential status and Exemption u/s 10

CO 2: Apply the provisions with respect section 15, 16, and 17 of income tax act and Compute the income from salary of an individual.

CO 3: Apply the provisions with respect to sections 28, 29, 30, 31, 32, 36, 37, 40, 43 and 44 of income tax act and Compute the income from business or profession.

CO 4: Apply the provisions under chapter VIA and Compute the taxable income and tax liability of the individual assessee.

Core Course 14: Accounting for Service Organisation

After completing the course, the student will be able to:

CO 1: Understand the nature and working of service organizations and will be capable of performing accounting for the service organization.

CO 2: Learn legal aspects of banking and insurance companies' format.

CO 3: Study RBI guidelines regarding final accounts of banking companies.

CO 4: Prepare final accounts of General Insurance companies, banking companies and hotel.

Skill Enhancement Course 01: Business Laws

After completing the course, the students will be able to;

CO 1: Analyze, explain and apply the basic provisions of the Indian Contract Act, 1872 in relation to general principles of contract and specific contracts.

CO 2: Analyze, explain and apply the laws related to the Sale of Goods Act, 1930.

CO 3: Analyze, explain and apply the provisions of the Arbitration and Conciliation Act, 1996.

CO 4: Analyze, explain and apply the laws governing various Negotiable Instruments (i.e. promissory notes, bills of exchange and cheques) including dishonour of cheque under the Negotiable Instruments Act, 1881.

CO 5: Draft various types of notices, agreements, bonds and affidavit.

Skill Enhancement Course 01: Computer Applications for Business-I

After completion of the course, students will be able to:

CO 1: Understand usefulness of Information Technology tools for business operations.

CO 2: Analyze business data that involves use of spreadsheet and spreadsheet add-ins.

Skill Enhancement Course 02: Companies Act and IPR Laws

After completing the course, the students will be able to;

CO 1: Analyze, explain and apply the primary provisions of the Companies Act, 2013.

CO 2: Analyze, explain and comprehend the classification of Directors, key managerial personnel, meetings of companies and the committees connected with the affairs of a company.

CO 3: Analyze, explain and apply the laws related to books of accounts and winding up of a company.

CO 4: Analyze, explain and apply various provisions related to IPR including registration process and remedies available for violation of patents, trademarks,design and copyrights under various Acts.

CO 5: Draft various documents related to Companies (such as MoA, AoA, minutes of meetings, notice, Auditor's report etc) and IPR (application forms, patent license agreement, notice for infringement.

Skill Enhancement Course 02: Computer Applications for Business-II

After completion of the course, students will be able to:

CO 1; Understanding concept of e-commerce, ERP, security and encryption w.r.t business through electronic means.

CO 2: Understanding concept of DBMS and related issues.

CO 3 Imparting practical knowledge on use of MS-Access as DBMS software.

Generic Elective 03: Business Statistics – I

Expected Course Learning Outcome:

CO 1. Learner will acquire the basic knowledge of Business statistics and its applications in the field of commerce and industry.

CO 2. Students will learn and understand the wide ranging applications of mathematical

techniques to commerce, economics and practical situations.

CO 3. Students will learn the skill of interpretation of results

Generic Elective 03: Business Environment – I

After completion of the course, students will be able to:

CO 1: Explain the concepts of business and business environment and differentiate between the external/internal and micro/macro environments of business

CO 2: Describe the concept of socio-cultural environment and demographic environment and analyze the impact of these environments on business.

CO 3: Explain the concept of technological environment and natural environment, recognize the different types and sources for innovations, describe the impact of technology on business and assess the impact of natural environment on business

CO 4: Discuss the concept of political environment and its bearings on business.

Generic Elective 03: Retail Management

After completing the course, the student will be able to:

CO 1: Identify various retail management functions and activities.

CO 2: Understand the various retail formats that a retailer can adopt.

CO 3: Understand the significance of selecting a store location.

CO 4: Acquaint themselves with the important aspects of store design and layout such as visual merchandising, preventing shoplifting and employee theft.

Generic Elective 03: Indian Capital Markets

After completion of the course, students will be able to:

CO 1: Explain structure, Role of Indian capital market and SEBI in Indian Capital Market.

CO 2: Explain the role and structure of primary markets and merchant banking in India.

CO 3: Explain the role of secondary market and stock market indices in Indian stock market

CO 4: Explain structure and trading settlement mechanism of derivatives market in India.

Generic Elective 04: Environmental Ethics- I

After completion of the course, students will be able to:

CO 1: Students will be able to learn and evaluate different theories of environmental ethics.

CO 2 : Realize the significant role and responsibility towards the protection of the environment.

CO 3: To analyse different approaches and broad theories of environmental philosophy.

CO 4 Understand the philosophical basis of various conservative theories.

Generic Elective 04: Economics of Resources

On the completion of the Course the student would be able to:

CO 1: Recognize and explain the basic concepts of environmental economics, sustainable development, energy security, energy audit, energy & water pricing, and human resource development.

CO 2: Identify the different types of economic efficiencies, externalities, market failures, and market approach to solve environmental problems.

CO 3: Apply their knowledge to solve the problems of economic situations and improve the environment quality.

CO 4: Assess different economic situations, problems of energy and water scarcity, environmental degradation, and problems of health and education, based on the concepts learnt and practical understanding gained.

Generic Elective 05: Business Statistics – II

Expected Course Learning Outcome:

CO 1: Students will learn and understand the wide ranging applications of mathematical

techniques to commerce, economics and practical situations

CO 2: Learner will acquire the basic knowledge of Business statistics and its applications in the field of commerce and industry.

CO 3. Students will learn the skill of interpretation of results.

Generic Elective 05: Business Environment – II

After completion of the course, students will be able to:

CO 1: Explain concept of economic environment and assess the impact of various policies on business.

CO 2: Assess the effect of laws, regulations and legal acts on business in India.

CO 3: Discuss the industrial policy of India and its evolution since independence and infer the position of the country in the global context.

CO 4: Discuss the environment of business in the state of Goa.

Generic Elective 05: Financial Services

After completing the course, the student will be able to:

CO 1: Understand the different types of financial services

CO 2: Understand the process of depository system in India

CO 3: Identify various mutual fund products and plans

CO 4: Understand the Credit Rating and Securitization services

Generic Elective 05: E-Commerce And E-Accounting (GE-5)

After completion of the course, students will be able to:

CO 1: Explain the role and applications of E-commerce and M-commerce

CO 2: Explain the concept and applications of E-marketing, E-CRM and E-SCM

CO 3: Explain the concept and structure of e-payment system in India

CO 4: Implement E-accounting software in providing practical exposure to students

Generic Elective 06: Environmental Ethics- II

After completion of the course, students will be able to:

CO 1: Articulate and critically evaluate the various ethical perspectives

CO 2: Demonstrate the understanding of various ethical views and the human responsibility towards the environment

CO 3: To identify and critically reflect on religious perspectives and modern social movements for environmental protection

CO 4 Understand the scientific principles to develop practical solutions to environmental problems.

Generic Elective 06: Indian Economy

On the completion of the Course the student would be able to:

CO 1: Define the concepts of Indian economy and able to explain the features, government policies, market integration and current Indian economic situation.

CO 2: To identify the importance of various sectors like agriculture, industries and service sectors as a major contributor of GDP and Indian economic growth.

CO 3: Analyse the different problems/challenges faced by various sectors of Indian economy and foreign trade.

CO 4: Assess and suggest various solutions to the economic problems faced by Indian Economy and compare the Indian economy with world markets.

THIRD YEAR BACHELOR OF COMMERCE

Core Course 15: Industrial Management

After completion of the course, students will be able to:

CO 1: Understand the basics of industrial management including concept, importance, process of Industrial management.

CO 2: Analyse industrial productivity factors, its effects on various stakeholders and develop the competence to develop an environment which will help increase productivity.

CO 3: Understand the different quality management techniques and its applicability in industries.

CO 4: Analyze the various causes of industrial accidents and suggest ways to create a safe working environment.

Core Course 15: Indian Monetary & Financial System

On the completion of the Course the student would be able to:

CO 1: Understand the concept of Money and financial market and explain the role of RBI, SEBI and other financial intermediaries in the financial system of India.

CO 2: Build up a database on financial system of India with the help of secondary data sources and analyze the flow of funds from/to different sectors in the economy, role of RBI and SEBI in Money and Capital Market.

CO 3: Examine the functioning of different components of financial markets and instruments.

CO 4: Compare and assess the recent changes in the Indian Monetary and Financial system for the planning of optimal utilization of financial resources in the future.

Core Course 16: Human Resource Management

After completion of the course, students will be able to:

CO 1: Understand the basics of Human resource management including Human Resource Planning, Job analysis, recruitment, selection and placement; and evolve the ability for recruitment planning in an organization.

CO 2: Analyze the compensation plans and employee empowerment activities in organizations and grow expertise to evaluate employee empowerment activities of organizations.

CO 3: Evaluate Human Resource activities in terms of employee welfare, well-being, through a field visit to one of the top-rated hotels in North Goa.

CO 4: Suggest methods for managing human resources and retaining manpower.

Core Course 16: International Economics

On the completion of the Course the student would be able to:

CO 1: Recognize and explain the concept and principles of International Trade, Balance of Payment, Foreign Exchange Market, Foreign investment, Multilateralism and Regionalism.

CO 2: Evaluate the data on BOP of India; identify the reasons for fluctuations in foreign exchange market, trends in foreign investment, multilateral and bilateral trade flows of India.

CO 3: Assess the gains from international trade, types and causes of BOP disequilibrium, types of foreign exchange transactions, impact of foreign investment on capital market and exchange rate, objectives and principle of WTO.

CO 4: Compare BOP of India pre and post liberalisation, foreign investment inflows and outflows, analyse the impact Multilateralism and regionalism.

Discipline Specific Elective 01: Income tax and Goods & Services Tax

CO 1: - To explain and apply the provisions of sections pertaining to House property Income and to prepare a Statement of House Property Income to compare the Self-Occupied HPI with Let Out HPI.

CO 2: - To describe the provisions of Income Tax Act pertaining to Capital Gains to distinguish between short term and long-term Capital Gains and to apply these provisions to Compute the STC Gains and LTC Gains.

CO 3:- To understand and apply the provisions of Income Tax Act pertaining to Income from other sources (Section 56, 57, 58) to Compute the Income under the head Income from other sources.

CO 4: - To understand and apply the provisions of Income Tax Act pertaining to Section 80 to Compute the amount of deductions to be claimed from Gross Total Income and advice the tax payer the ways to save their tax.

CO 5: - To Prepare the Statement Of Income of individual assessee's and Compute the tax liability on Net Taxable Income of the assessee.

CO 6: To understand the procedure of Filing of Returns and Payment of Tax and apply the same for submission of Income Tax Returns.

CO 7: - To understand the Provisions of the Goods & Services Act, 2017 and apply the same to compute the sum of IGST, CGST, SGST/UTGST payable to the Government.

CO 8:- To understand the procedure of Registration, Composition Scheme, and types of Assessments under GST and apply the Provisions of GST to file the GST Returns.

Discipline Specific Elective 01: Cost Accounting- I

After completion of the course, students will be able to:

CO 1: Explain the various cost concepts, terminologies, classifications, installation & importance of cost accounting.

CO 2: Explain the material purchase procedure and Compute the material purchase cost. It will also enable to student to understand material control, its needs and essentials.

CO 3: Compute the different stock levels to be maintained by store department and also computation of EOQ. Students will also understand the role of the store keeping department.

CO 4: Apply different material pricing issue methods and Compute store ledger account.

Discipline Specific Elective 01: International Marketing Management

At the end of this course, students will be able to:

CO 1: Outline the meaning of International Marketing, its importance and the challenges faced by managers in international markets.

CO 2: Discover strategies for entry into international markets and their advantages and disadvantages.

CO 3: Analyse the logic behind product and pricing policies adopted by companies in the international markets.

CO 4: Summarise the marketing communication mix and factors affecting the distribution policy in the international markets.

Discipline Specific Elective 02: Auditing

After completion of the course, students will be able to:

CO 1: Explain terminologies in audit, objectives, basic principles governing an audit and will also able to apply audit practices to different nature of concerns.

CO 2: Identify different types of internal controls and will also able to explain the procedure and methods for evaluation of internal control system.

CO 3: Prepare the plan of audit and apply the different techniques of auditing like vouching, verification & valuation while conducting audit of a particular company.

CO 4: Understand and explain the recent developments in auditing.

Discipline Specific Elective 02: Cost Accounting- II

After completion of the course, students will be able to:

CO 1: Explain the concepts of labour, Time keeping, Time booking, vacation time, holiday time, overtime premium, fringe benefits and labour turnover.

CO 2: Compute labour remuneration under different piece rate systems, individual incentive plans and group incentive plans of wage payment.

CO 3: Explain the collection, allocation and apportionment of overheads and Compute redistribution of overheads summary using under different methods.

CO 4: Compute the overhead absorption using the different methods of absorption and prepare comparative statement.

Discipline Specific Elective 02: Retail Management Strategies

After completion of the course, students will be able to:

CO 1: Explain the concept of product decision and life cycle of goods

CO 2: Explain the factors affection retail shopper and customers decision making process

CO 3: Explain the concept and application of servicing the retail consumer.

CO 4: Explain the concept of retail strategy, retail logistics management and supply chain management.

Discipline Specific Elective 03: Government Accounting

At the end of the course, the students will have competence in;

CO 1: Understanding and analyzing the Indian Government accounting system and the different terms relating to overall government functioning process.

CO 2: Understanding about the functioning and accounting of local self-governing bodies (Local government) such as Panchayats and municipalities.

CO 3: Understanding the accounting and auditing of works expenditure and also the general outline of the public works department /system with focus on capital budgeting and project evaluation.

CO 4: Understanding the nature and type of public corporations, their functioning and accounting procedures, with special emphasis on accounts of electricity corporations and transport corporations.

Discipline Specific Elective 03: Techniques of Costing

After completion of the course, students will be able to:

CO 1: understand conceptual knowledge of basics of Marginal Costing.

CO 2: Apply marginal costing in decision making related to price fixation, sales, profit planning etc.

CO 3: compute material & labour variances.

CO 4: understand and explain the concepts like management control system, transfer pricing, balance score card, performance budgeting and management reporting.

Discipline Specific Elective 03: Advertising Management

After completion of the course, learner will be able to:

CO 1: Summarize various types of Advertising media, factors influencing choice of media and understand the ethics and social responsibilities in advertising.

CO 2: Apply the principles of Effective Layout and effective copywriting in order to create impactful advertisements.

CO 3: Explain and understand the functioning of client Agency relationship and explore the various career options available in the field of Advertising.

CO 4: Apply and analyse the methods of pre-testing and post testing in measuring the effectiveness of an advertisement. Understand the DOGMAR MODEL in evaluating an advertisement.

Discipline Specific Elective 04: Financial Reporting

After studying this course, the student will be able to:

CO 1: Understand the concept of Financial Reporting, Regulatory Framework and current Financial Reporting Practices in India.

CO 2: Recognize the conversion of IAS with GAAP and its application.

CO 3: Compute Value Added Statements and its applications.

CO 4: Analyze Financial Statements and Understand the adoption and conversion of IFRS.

Discipline Specific Elective 04: Management Accounting

After completion of the course, students will be able to:

CO 1: Explain the nature, scope and functions of management accounting

CO 2: Explain the concept of budgetary control and Prepare different types of budget.

CO 3: Explain the different methods capital budgeting and compute payback period, average rate of return, net present value and profitability index

CO 4: Explain the concept and application of target costing and enterprise resource planning.

Discipline Specific Elective 04: Service Marketing- II

After completing the course, the student will be able to:

CO 1: Understand the different types of services offered by Tourism & Hospitality industry.

CO 2: Understand the different types of services offered by banking industry.

CO 3: Understand about life insurance and general insurance business.

CO 4: Understand emerging trends in Services.

Discipline Specific Elective 05: Advanced Company Accounts

At the end of the course the students will have competence in;

CO 1: Preparation of Balance sheet and Statement of profit and loss as per schedule III of the Indian companies act 2013 (amended)

CO 2: Understanding and analyzing the various aspects and modes of internal reconstruction, the accounting procedures and legal aspects involved.

CO 3: Understanding and analyzing the circumstances under which the goodwill is to be valued, factors affecting valuation of goodwill, the methods involved therein and also the meaning and need for valuation of shares, factors governing valuation of shares and the methods of valuation involved.

CO 4: Understanding the concepts of Mergers, Acquisitions, and different forms of external reconstruction with the accounting procedures to be followed in the books of Vendor Company and the Purchasing Company.

Discipline Specific Elective 05: Advanced Cost Accounting- I

After completion of the course, students will be able to:

CO 1: Explain the concept of Job order costing and Prepare the Job Cost Sheet, Tender and Quotation and determine the Economic Batch Quantity.

CO 2: Compute the operating cost sheet of the service organization.

CO 3: Prepare the Reconciliation statement of financial profits with cost profits and will also be able to Explain the need and reasons of reconciliation.

CO 4: Explain the techniques of Cost Control and Cost Reduction.

Discipline Specific Elective 05: Financial Management

After completion of the course, students will be able to:

CO 1: Explain the concept, determinants, types and models of dividend policy

CO 2: Explain the concept and types of cost of capital. Compute the different types of cost of capital.

CO 3: Explain the types of capital budgeting decision and project evaluations. Compute the non-discounting criteria and discounting criteria of project evaluation.

CO 4: Explain the different types of capital structure theories. Compute operating leverage, financial leverage and composite leverage

Discipline Specific Elective 06: Accounting- I

CO 1: - To distinguish between the two systems (Hire Purchase system & Instalment system) to compare the two same for applicability purpose and to prepare a Statement of Analysis of Instalment and other accounts pertaining to both the systems.

CO 2: - To understand and apply the concept of Minimum Rent, Short-working Recoupment of Short-working and Prepare the Royalty accounts in the books of Lessor, Lessee and Sub-Lessee.

CO 3: - To Prepare Departmental Final accounts for ascertaining profitability of each department and interpret the results to take corrective steps if necessary.

CO 4: - To understand the Concept of Branch Accounts and apply the same to Prepare Branch Accounts under Debtors system and Stock and Debtors system to ascertain the profitability position of the Branch.

Discipline Specific Elective 06: Cost and Management Audit

After completion of the course, students will be able to:

CO 1: Explain the concepts of Cost audit & it scope, Efficiency audit, Proprietary audit, Management audit, Social Audit, Performance audit, Operational audit and Energy Audit.

CO 2: Apply important provisions of companies Act 2013 with respect to books of accounts, appointment of cost auditor, rights and duties, responsibilities, status of auditor, liabilities, Professional ethics and code of conducts and special penal provisions.

CO 3: Prepare the plan of the audit and Apply different techniques in conducting audit.

CO 4: Understand and Apply the cost records rules and audit report rules.

Discipline Specific Elective 06: Strategic Management

After completion of the course, learner will be able to:

CO 1: Compare and Contrast between strategic management and operational Management. Apply and analyse the stages in strategic management process.

CO 2: Understand the formulation of vision, Mission and objectives. Analyse the internal and external factors of environment.

CO 3: Apply and analyse the models of strategic analysis.

CO 4: Apply and analyse the steps and techniques involved in strategic implementation evaluation and control.

Discipline Specific Elective 07: Accounting- II

After completion of the course, students will be able to:

CO 1: Prepare Receipt and Expenditure Account / Profit & Loss Account and Balance Sheet of different Professionals

CO 2: Compute value of Investment considering Ex-interest, Cum-Interest Quotations, Brokerage, Securities Transaction Tax and Other Expenses.

CO 3: Understand concept of Redemption of Debentures, Sources of finance, methods for redemption of debentures and will also able to prepare Journal entries and ledger Accounts regarding redemption of debentures.

CO 4: Understand the meaning and features of liquidation and develop analytical skills in preparation of Liquidator's Final Statement of Account.

Discipline Specific Elective 07: Advanced Cost Accounting- II

After completion of the course, students will be able to:

CO 1: Understand and comprehend the concept of Process costing, Equivalent Production and Prepare and determine the cost in the process costing.

CO 2: Compute and analyse the cost incurred in Contract Costing including work uncertified, escalation clause and estimation of contract costs.

CO 3: Prepare and understand the principles of integral and non-integral accounting statement and will also be able to understand the implementation of activity-based costing.

CO 4: Understand and Explain the need of uniform costing and installation of uniform costing manual and also explain the requirement and scheme of Inter Firm comparison.

Discipline Specific Elective 07: Supply Chain & Logistics Management

After completing the course, the student will be able to:

CO 1: Gain sound foundation in the technical knowledge necessary in the field of supply chain management and become familiar with current supply chain management trends

CO 2: Analyze operations and supply chain management issues in a firm.

CO 3: Demonstrate operational purchasing methods and techniques on supplier management and supply in specific business contexts.

CO 4: Integrate and critically evaluate qualitative and quantitative information to make better decisions related to various SCM activities.

Discipline Specific Elective 08: Corporate Accounting & Tax Planning

After completing the course, the student will be able to:

CO 1: Develop skills for preparation of books of accounts in respect of consolidations of companies

CO 2: Develop skills for preparation of books of accounts in respect of incorporations of companies

CO 3: Understanding the accounting treatment of employee benefits under employee stock option plan

CO 4: Familiarize students with tax planning provisions and mechanisms available for corporate entities

Discipline Specific Elective 08: Advanced Management Accounting

After completion of the course, students will be able to:

CO 1: Explain the concept of marginal costing and compute practical application of marginal costing in decision making

CO 2: Explain the concept of cost management of service sector. Prepare cost statements of power house costing and hotel costing

CO 3: Explain the concept and application of Strategic costing and Activity based costing. Prepare cost statements on activity based costing method and traditional costing.

CO 4: Explain the concept and application of developments of business environment, just in time approach and Quality Management

Discipline Specific Elective 08: Brand Management

At the end of this course, students will be able to:

CO 1: Define a brand, summarise the evolution of brand over its life-cycle, categorize the different types of brands and evaluate the opportunities and challenges in brand management.

CO 2: Analyse and compare the different strategies brand managers can adopt for various situations.

CO 3: Explain the concepts of brand communication, brand extension and brand equity and the different aspects related to them.

CO 4: Compare the different methods for measuring brand equity and identify the methods for measuring the performance of the brands.

Programme Outcome for Bachelor in Arts (General):

PO1: Communication Skills : A graduate student in arts/social sciences/humanities shall be confident to speak, write, read, listen and understand the English language and one or more Indian languages. Relate the ideas, knowledge, books, and people. Think and decide rationally, and adopt technology and electronic/print media in disseminating thoughts, facts and realities.

PO2: Social responsibility: Develops an obligation to act for the benefit of society at large. Cultivates the responsibility to maintain a balance between the economy and the ecosystems. Nurtures a moral obligation to minimize the adverse effect on those immediately around them.

PO3: Critical, logical and rational thinking: Acquire the ability for objective, rational, skeptical, logical, and unbiased analysis of factual evidences to form a judgment or conclusion. Enhance the process of rational thinking, problem solving and analytical evaluation from different perspectives.

PO4: Enlightened and effective Citizenship: Cultivates progressive citizenship for a knowledge society for peace and prosperity of nations and the world. Develops clear, rational and progressive thinking. Participating in decision-making concerning the society and upholding national development, integrity, unity and fraternity.

PO5: Values and Ethics: Recognizes the importance, worth and usefulness of principles and standards of behaviour, moral dimensions of one's own decisions ad judgment of what is important in life. Understand the rules of behaviour based on systematizing, defending and recommending the concepts of right and wrong.

PO6: Sustainable development: Understands, organizes and promotes the principle of human development goals by sustaining the ability of natural systems, natural resources and ecosystem services upon which the economy and society depends.

PO7: Life-long process of Learning: Cultivates the proficiency to engage in independent, life-long and progressive learning abilities in the broadest context of changing socio-politico-economic-cultural and technological scenario.

DETAILS OF COURSE OUTCOME IN THE SUBJECT OF ENGLISH

CLASS:FYBA
COURSE:COMMUNICATIVE ENGLISH / 1.1

COURSE OUTCOME:

SEMESTER: I

CO1: Development of the skills of listening, reading and writing.
CO2: The ability to undertake other day- to -day personal and professional transactions using English as the medium of communication.
CO3: An increase in the proficiency/command over the English language.
CO4: The acquiring and sharpening of language skills.
CO5: Knowledge of grammatical units.

SEMESTER:II
COURSE:COMMUNICATIVE ENGLISH / 1.2

CO1: Familiarity with the Writing process.
CO2: Familiarity with the conventions of Academic Writing.
CO3: Mastering the skills of Summarizing and Paraphrasing.
CO4: The ability of thinking critically, synthesizing , analyzing and evaluating.
CO5: Interpreting details and expressing ideas coherently.
CO6: Acquiring accuracy in different kinds of writing – descriptive, narrative, expository, argumentative and persuasive.
CO7: The ability of editing books and media reviews.
CO8: Writing any kind of compositions like diary writing, dialogue, and interviews and summarizing.
CO9: Narrating incidents, real and imaginary with descriptive details and in sequence.
CO10: Condensing ideas where brevity is of essence.
CO11: The ability to interpret simple technical data.

CLASS:SYBA
SEMESTER: II
COURSE:ADVANCED COMMUNICATIVE ENGLISH./2.1

CO1: Enhanced skills of reading, writing and listening.
CO2: Recognition and awareness of different genres of writing.
CO3:Enhanced creativity of the students.
CO4: The ability to undertake translation

SEMESTER : IV
COURSE: ADVANCED COMMUNICATIVE ENGLISH./2.2
CO1: The ability to write reports.
CO2: Proficiency through an analysis of literary extracts.
CO3: Familiarity with different genres of literature.
CO4: The ability to edit a given text.
CO5: Development of skills of critical appreciation.
CO6: Ability to make a PPT, video, short film
CO7: Enhanced communication skills.

Course Outcomes
Courses taught by the Department of Political Science

Programme Specific Outcome of Bachelor of Arts in Political Science

PSO1: Comprehending the basic concepts and theories; political institutions and processes in Political Science in terms of historical and analytical perceptions.
PSO2: Familiarising with the origin and development of Constitutional provisions that guide the state policy, political processes and protect people's rights from both local and national perspectives, Impact of these processes on the political issues in the country.
PSO3: Understanding the basic concepts and issues related to Administration, Management, Recruitment, and Training in Public Administration.
PSO4: Analyse the basic concepts and issues associated with Planning, Development, Public Services and Public Financial Administration in India.

PSO5: Acquainting with the concepts and issues in International Relations and important developments in terms of theory, actors, institutions and processes.
PSO6: Understanding the principles of India's Foreign Policy including its central realities, issues and developments from contemporary perspectives, major bilateral and multilateral engagements with economic and political challenges.
PSO7: Critically understanding the philosophical themes in Western Political Thinking by studying select political thinkers from early Greek period to modern times.

Semester-I: PSC101 (Discipline Specific Core) - Course Outcomes
"Introduction to Political Theory"

CO1: Explain the origin, nature, scope and significance of Political Science.
CO2: Write about the traditional and modern approaches.
CO3: Expound the theories of origin of State.
CO4: Elaborate the development of State.
CO5: Examine the concept of Welfare State.
CO6: Elucidate the concept of Power, Authority, Legitimacy and Sovereignty.
CO7: Elaborate the ideologies: Liberalism, Democracy, Marxism and Gandhism.

Semester-II: PSC102 (Discipline Specific Core) - Course Outcomes
"Politics and Political Ideas"

CO1: Clarify the concepts of liberty, equality and justice and their types.
CO2: Explain the modes of acquiring and loosing citizenship.
CO3: Write down the different ways of building public opinion.
CO4: Expound factors influencing political participation.
CO5: Analyse the role of media in Politics.
CO6: Describe the agents of Political Socialisation and Political Culture.
CO7: Elaborate the kinds of Rights and Political Obligation.
CO8: Explain the features of Nationalism, Regionalism and Globalisation.

Semester-III: PSC103 (Discipline Specific Core) - Course Outcomes
"Indian Constitution"

CO1: Role of the Constituent Assembly in making of the Indian Constitution.
CO2: Explain the Fundamental Rights and Duties, and Directive Principles of State Policy.
CO3: Explain composition, powers and functions of Council of Ministers.
CO4: Examine the role of the Speaker, Prime Minister and the President of India.
CO5: Elaborate the composition, functions and responsibilities of Parliament.
CO6: Explicate the Legislative procedure and the Committee system.
CO7: Write about the structure, composition and functions of the Judiciary.
CO8: Explain Judicial independence, Judicial review and Judicial Activism.

Semester-IV: PSC104 (Discipline Specific Core) - Course Outcomes
"Constitutional and Social Issues in India"

CO1: Write about the Federal system and Centre-State relations in India.
CO2: Explain the Panchayati Raj System in India.
CO3: Explain the Party System in India.
CO4: Analyse the elections and election procedure in India.

CO5: Examine the Electoral Reforms in India.
CO6: Elaborate criminalisation of Politics.
CO7: Articulateon politicisation of religion, caste, reservation, language and gender issues.
CO8: Explain Right to Education, Right to Work and Right to Food.

Semester-V: PSD103 (Discipline Specific Elective) - Course Outcomes
"Public Administration"

CO1: Explain the nature, significance, approaches, role of Public Administration. Difference between Private and Public Administration; Public Administration and NewPublic Administration
CO2: Explain the importance, principles, bases and structure of Organisation; Line and Staff agencies.
CO3: Write down the importance, theories, types and functions of Management.
CO4: Elaborate on the importance and types of Bureaucracy, Recruitment and Training.
CO5: Explain Civil Service Neutrality and Politicisation.
CO6: Examine the importance of Good Governance and reforms in the era of Globalisation.
CO7: Elucidate e-governance and use of ICT in Public Administration.
CO8: Explain the latest trends in Public Administration-PPP; BOOT.

Semester-V: PSD101 (Discipline Specific Elective) - Course Outcomes
"International Relations"

CO1: Explain the nature, evolution, significance and interdisciplinary nature of International Relations.
CO2: Examine the theories – Realism, Idealism, Neo-liberalism, Neo-Realism and Game theory.
CO3: Write down the values of the State and changing role of the State.
CO4: Analyse the role of Non-government Organisation and Multinational Corporations.
CO5: Explain the features and impact of Globalisation.
CO6: Write down the role and impact of Multilateral Economic Institutions: IMF, World Bank and WTO.
CO7: Elucidate on Conventional and Non-conventional threats of war.
CO8: Explain Inter-State conflicts, Terrorism, Energy Security, Refugees.

Semester-V: PSC105 (Discipline Specific Core) - Course Outcomes
"Western Political Thinkers (Plato to John Locke)"

CO1: Explain the life and works of the select thinkers, their major theoretical and philosophical contributions.
CO2: Examine Plato's concept of Justice, Education, Ideal State, Communism, Philosopher King and the rule of Law.
CO3: Examine Aristotle's views on State, Government, Revolution, Citizenship, Slavery, Property and Family.
CO4: Elucidate Machiavelli's ideas on Human Nature, Principalities, concept of Power, Prudent Prince, Art of War, Religion and Morality.
CO5: ElaborateHobbes views on Human Nature, State of Nature, Social Contract theory, Sovereignty, Religion and Absolutism.
CO6: Explain Locke's views on Human Nature, State of Nature, Social Contract theory, Natural Rights, Right to Resist, Constitutional Government.

Semester-VI: PSD104 (Discipline Specific Elective) - Course Outcomes
"Indian Administration"

CO1: Inscribe on Integrity, Transparency and Accountability in Administration
CO2: Explain the forms, causes and remedies of corruption and the measures to combat corruption: Lokpal, Lokayukta, Right to Information Act 2005 and Citizens Charter..
CO3: Write down the importance, types and objectives of Planning in India.
CO4: Evaluate the working of Planning Commission, NationalDevelopment Council and NITI Aayog.
CO5: Write on history of Social Welfare Development and agencies of Social Welfare.
CO6: Explain basic Public Services: Education, Health, Sanitation and Housing.
CO7: Elaborate Financial Administration: meaning, types, principles and process of making Budget and voting on Finance Bill.
CO8: Explain Finance Committees: Public Accounts Committee, Estimates Committee, Comptroller and Auditor General.

Semester-VI: PSD102 (Discipline Specific Elective) - Course Outcomes
"India's Foreign Policy"

CO1: Write down the determinants, objectives and principles of India's Foreign Policy.
CO2: Explain the objectives, evolution and relevance of Non-Aligned Movement.
CO3: Elaborate on India's role in the emerging global Political Economy: United Nations, WTO, SAARC and BRICS.
CO4: Evaluate India's relations with major powers of the world: United States and China.
CO5: Explain the challenges and prospectus of India with its neighbours: Pakistan, Sri Lanka and Bangladesh.
CO6: Write on Terrorism in India and the measures taken to counter terrorism in India.
CO7: Elucidate on India's security challenges: Energy Security, Nuclear threats and Policy Responses.

Semester-VI: PSC106 (Discipline Specific Core) - Course Outcomes
"Western Political Thinkers (Plato to John Locke)"

CO1: Explain the life and works of the select modern western thinkers, their major theoretical and philosophical contributions.
CO2: Examine Rousseau's ideas on stages of Human development, Social Contract Theory, General Will, Equality, Education, Popular Sovereignty.
CO3: Explain Burke's ideas on State, Natural Law, Natural Rights, Revolution, Liberty, and Conservatism.
CO4: Elucidate Mill's ideas on Utilitarianism, Individualism, Liberty, Representative Government, Emancipation of Women, and Political Economy.
CO5: Explain Hegel philosophy on Dialectics, History, views on State, War and International Law, and concept of Geist and Freedom.

CO6: Explain Marx's ideas on Dialectic Materialism, Materialistic interpretation of History, Theory of Surplus Value, Theory of Class War, Dictatorship of Proletariat, and Classless Society.

Semester-I: Generic Elective - Course Outcomes
"M.K. Gandhi's Social Thought"-PSG104

CO1: Explain Gandhi's life sketch, his works and contribution with special reference to anti-apartheid and freedom movement.
CO2: Examine Gandhi's concepts of Truth, Non-violence and Ethical Religion.
CO3: Elaborate Gandhi's philosophy of Satyagraha.
CO4: Elucidate Gandhi's practice of Satyagraha in India's struggle for independence.
CO5: Elaborate Gandhi's views on Caste and Varna Dharma.
CO6: Reveal the efforts made byGandhi towards removal of untouchability.
CO7: Explain Gandhi's efforts to achieve Hindu-Muslim unity.
CO8: Expand onGandhi's Constructive Programme- Basic Education, Village Sanitation and National Language.

Semester-II: Generic Elective- Course Outcomes
"M.K. Gandhi's Political and Economic Thought"-PSG104

CO1: Explain Gandhi's views on State and role of Government.
CO2: Examine Gandhi's criticism of Parliamentary Democracy.
CO3: Expound Gandhi's concept of Swaraj.
CO4: Reveal Gandhi's ideas on Sarvodaya.
CO5: Elaborate Gandhi's views Panchayati Raj System.
CO6: Elucidate Gandhi's economic ideas with reference to Industrialisation, Swadeshi and Trusteeship.
CO7: Examine relevance of Gandhi in the contemporary world.

Semester-III: Generic Elective -Introduction to Human Rights -PSG107

Course Outcomes

CO1: Bring out the emergence of the concept of Human Rights.
CO2: Explain the various types of human rights
CO3: Elaborate the Universal Declaration of Human Rights.
CO4: Elucidate the International Covenants on Economic, Social and Cultural Rights; Civil and Political Rights; and International Covenant on the Elimination of all forms of discrimination with reference to vulnerable groups, e.g. women and children
CO5: Elaborate the Fundamental Rights and Directive Principles of State Policy with reference to India.
CO6: Explain the formation, composition and functions of National Human Rights Commission.
CO7: Examine Human Rights situation in India with reference to response of Civil Society, Judicial Activism, United Nations and Human Rights Commission.

Sem-IV: Generic Elective-Human Rights Movements in India-PSG108

Course Outcomes

CO1: Explain evolution of Human Rights movement in India
CO2: Explain Indian Civil Liberties Union as an organization.
CO3: Expound the concept of Different Civil Liberties movements.
CO4: Reveal ideas associated with LGBT and Women's movements.
CO5: Elaborate on Environmental movements.
CO6: Elucidate people's movements in Goa.
CO7: Examine role of Goa State Commission for protection of child rights.

Sem III-Skill Enhancement course-Leadership skills in Politics P-SS104

Course Outcomes

CO1: Expound the nature and importance of Leadership.
CO2: Clarify the Principles and Theories of Leadership.
CO3: Analyse the Qualities and functions of the Leader.
CO4: Examine the various leadership styles with case studies of Leaders.
CO5: Explain Leadership in Political and Social Movements.
CO6: Elaborate on Narmada Bachao Andolan, Anti-Corruption movement, etc.
CO7: Elucidate the Features of Indian Political System.
CO8: Assess the Role of Government Institutions and Process.

Sem-IV: Skill Enhancement Course- Introduction to Political Reporting-PSS102

Course Outcomes

CO1: Explain Meaning and concept of Journalism, different types of Journalism.
CO2: Explain different sources of News.
CO3: Expound the concept of News gathering.
CO4: Reveal ideas associated with Verification and News packaging.
CO5: Elaborate on institutions of political reporting.
CO6: Elucidate basic issues like Caste, Religion, Languages, Crime and Corruption
CO7: Examine writing for print media and reporting for electronic digital media.

DEPARTMENT OF ECONOMICS

Courses taught by the Department of Economics

Program Specific Outcome (PSO) for Bachelor of Arts in Economics (General)

PO1: After completion of UG to pursue professional education the graduates in Economics can specialise in Economics (Entire/Agricultural/ Financial/ Trade/Econometrics/Environment/Statistics) in all Indian Universities.
PO2: To pursue professional education the graduates in Economics can enter into specialised institutes as IGIDR, Banking Institutes, Institutes related to Trade, Central Universities

in India, IMF, WORLD BANK, WTO and thereby make career in teaching and research.

PO3: The students can study MBA course through CAT in various renowned institutes in India.

PO4: The students can do post-graduation in traditional course as M.A. in Economics and also specialise in Planning and Development institutes in India.

PO5: The students can study MSW course, either take up service or establish NGO in India or outside.

PO6: The students can prepare for State and Union Public Service examinations including administration in general and financial, foreign relations, banking, economic, statistical and revenue in particular.

PO7: They can enter into the field of Journalism and specialise in financial journalism.

PO8: The graduates can pursue career as Environmentalist, project assistants, consultants, pursue Law.

PO9: The graduates in Economics can initiate careers in Stock markets, banking and insurance sectors, private and public organization and as an accountant in private and public sector.

PO10: The graduates in Economics can enter into any business and trading in local, national or global markets.

The degree program in Economics at Goa University under CBCS includes a core group of theory courses, a series of generic and skills based courses, and discipline specific courses that involve the applications of economic theory and analysis to major areas of study within the discipline.

Course Outcomes of Macroeconomics -I (DSE Course Code : ECC103) S.Y.B.A. (Semester-III)

CO1: Identify key macroeconomic indicators and measures of economic change, growth and development.

CO2: The students are trained in understanding the distinction and functioning of macro economies and the macro economic issues.

CO3 : The students are able to analyse the major concepts of GDP and its measurement.

CO4: The students are able to identify and describe the relationship of GDP growth, stability in real and nominal terms.

CO5: The students are able to understand monetary, fiscal, demographic indicators, variables and economic model building.

Macroeconomics -II (Course code: ECC104)
S.Y.B.A. (Semester- IV)

CO1: Identify key monetary , employment indicators and measures of economic change, growth and development.

CO2: The students are trained in understanding the macroeconomic issues in the form of inflation, unemployment and trade-off.

CO3 : The students are made ready to assess the major concepts inflation, unemployment, Phillips curve and business cycles.

CO4: The students are able to understand monetary, fiscal, demographic indicators, variables and economic model that prevail in real world.

CO5: The students are able identify the fiscal and monetary policy use during the upswing and downswing and in combating the inflation in developed and developing economies.

COURSE OUTCOMES
Discipline Specific Course I: Public Finance-I (ECD107)
T.Y B.A Semester -V

CO1: The students develop the ability to explain core economic terms, concepts and theories.
CO2: The students are trained in understanding the distinction and functioning of fiscal operation of the state and budget making process in India .
CO3: Identify key fiscal indicators and fiscal policy instruments, fiscal policy objectives and its effects with refences to economic change, growth and development.
CO4: After the completion of the course the students will be able to understand the role of Budget in macroeconomic management and preparation of budget. The students are acquainted with the budget making process through major concepts of deficits and its measurement with special reference to India .
CO5 : The study develops the ability to understand the financial transfers between the different tiers of the Government

Discipline Specific Course II: Public Finance-II (ECD108)
T.Y B.A Semester-VI

CO1: Identify and understand the key revenue, direct and indirect tax indicators , expenditure indicators, debt indicators .Are able to distinguish between the sources of revenue and non-tax revenue .
CO2: Able to distinguish between the tax rates, the students will be able to understand the Indian tax system and reforms undertaken.
CO3 : The students will able to understand classification of revenue and expenditure and explain the use of benefits and cost analysis in public expenditure as well as effects of public debt in India and at global level.
CO4: The students will be able to analyse the role of public revenue and public expenditure in macroeconomic management
CO5: The students will be able to analyse the role of public revenue and public expenditure in macroeconomic management
CO6: The students are able to define and assess the relationship of fiscal instruments and growth, stability in real and nominal terms in India and other modern economies.

COURSE OUTCOMES(CO)

Discipline Specific Course II : International Economics- I (ECD109)
T.Y B.A Semester- V

CO1: Develop the ability to explain core economic terms and concepts and distinction between internal and international trade and trade indicators of International economics.

CO2: Identify and discuss the key concepts underlying comparative advantage and modern theories of trade as well as the functioning of global economy and growth in international trade with reference to post 1991 period.

CO3: Identify key trade indicators as Gains from trade and measures of gains through the concept of terms of trade and its effects on developed and developing economies.

CO4: The students are trained in understanding the distinction between free trade and protection and functioning of trade policies.

CO5: Analyse the growth of Global trade and India's foreign trade with reference to Globalisation and its implications.

Discipline Specific Course II : International Economics-II (ECD110)
T.Y B.A Semester -VI

CO1: Identify key trade indicators of Balance of payment and understand the structure, disequilibrium and analyse the growth and learn the efficacy of corrective measures.

CO2: The students will be able to know the functioning of foreign exchange market, classification of rates of exchange and determination of foreign exchange rate and convertibility of Rupee.

CO3: The students are able analyse the major concepts of Foreign Investment, Brain Drain and its effects on trade and growth.

CO4: The students are able to identify the relationship between Regionalism, Multilateralism and trade specifically and growth, stability in real and nominal terms in general.

CO5: The students will also be able to understand and list the impact of global trade and institutions that govern global trade.

B.Sc. Botany
Programme Outcomes (PO's)

PO1. Understanding of Plant Diversity and its importance in the maintenance of ecological balance.

PO2. Students learn to carry out practical work, in the field and in the laboratory, interpreting plant morphology and anatomy, Plant identification, Vegetation analysis techniques.

PO3. **A**pply the knowledge of basic science, life sciences and fundamental process of plants.

PO4. Apply modern techniques and instruments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological studies of plants with an understanding of the applications in human life.

PO5. Apply the knowledge gained from the studies for the upliftment of society via addressing health, environmental issues, food scarcity etc.

Programme Specific Outcomes (PSO's)

PSO1. Critical evaluation of ideas and arguments by collecting relevant information about the plants, so as to recognize their position in the classification systems and at phylogenetic level.

PSO2. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.

PSO3. Students will be able to compare and contrast the characteristics of the different groups of plants such as algae, fungi, bryophytes, pteridophytes, gymnosperms and angiosperms.

PSO4. Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth.

PSO5. Students will be able to explain how Plants function at gene, genome, cellular and tissue level.

PSO6. Students will be will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems.

PSO7. Students will be able to conceive the idea of artificial propagation of plants via vegetative methods and to find a livelihood via establishing miniature plant nurseries.

B.Sc Botany Programme
Course Outcome (CO's)

Core course 1 Code: BO1CRT01
METHODOLOGY OF SCIENCE AND AN INTRODUCTION TO BOTANY
(Theory 36 hrs; Practical 36 hrs; Credits 2 + 1)

CO 1 – To understand the universal nature of science
CO 2 – To demonstrate the use of scientific method
CO 3- To lay a strong foundation to the study in Botany
CO 4 - Impart an insight into the different types of classifications in the living kingdom.
CO 5- Appreciate the world of organisms and its course of evolution and diversity.
CO 6- Develop basic skills to study Botany in detail

Core course 2 Code: BO2CRT02
MICROBIOLOGY, MYCOLOGY AND PLANT PATHOLOGY
(Theory 36 hrs; Practical 36 hrs; Credits 2 + 1)

CO 1- Understand the world of microbes, fungi and lichens
CO 2- Appreciate the adaptive strategies of the microbes, fungi and lichens
CO 3- To study the economic and pathological importance of microorganisms

Core course 3 Code: BO3CRT03
PHYCOLOGY AND BRYOLOGY
(Theory 54 hrs; Practical 36 hrs; Credits 3 + 1)

CO1- To study the evolutionary importance of Algae as progenitors of land plants
CO2- Understand the unique and general features Algae and Bryophytes and familiarize it
CO3- To study the external morphology, internal structure and reproduction of different types of Algae and Bryophytes
CO4- Realize the application of Phycology in different fields

Core course 4 Code: BO4CRT04
PTERIDOLOGY, GYMNOSPERMS AND PALEOBOTANY
(Theory 54 hrs; Practical 36 hrs; Credits 3 + 1)

CO1- Understand the diversity in habits, habitats and organization of various groups of plants.
CO2- To impart an insight into the modern classifications in lower forms of plants.
CO3- Understand the evolutionary trends in Pteridophytes and Gymnosperms.
CO4- Study the anatomical variations in vascular plants.
CO5- Understand the significance of Paleobotany and its applications.

Core course 5 Code: BO5CRT05
ANATOMY, REPRODUCTIVE BOTANY AND MICROTECHNIQUE
(Theory 54 hrs; Practical 36 hrs; Credits 3 + 1)

CO1- Imparting an insight into the internal structure and reproduction of the most evolved group of plants, the Angiosperm.
CO2- Understand the individual cells and also tissues simultaneously
CO3- Understand the structural adaptations in plants growing in different environment.
CO4- Understand the morphology and development of reproductive parts.
CO5- Get an insight in to the fruit and seed development.
CO6- Understand the techniques used to preserve and study plant materials.

Core course 6 Code: BO5CRT06
RESEARCH METHODOLOGY, BIOPHYSICS AND BIOSTATISTICS
Theory: 54 hrs; Practical: 45 hrs; Credits: 3 + 1)

CO1- To equip the students to conduct independent research and prepare research reports.
CO2- To make the students acquaint with different tools and techniques used in research work.
CO3- To equip the students with basic computer skills necessary for conducting research.
CO4- To enable the students to have enough numerical skills necessary to carry out research.

Core course 7 Code: BO5CRT07
PLANT PHYSIOLOGY AND BIOCHEMISTRY
(Theory 54 hrs; Practical 45 hrs; Credits 3 + 1)

CO1- Acquire basic knowledge needed for proper understanding of plant functioning.
CO2- Familiarize with the basic skills and techniques related to plant physiology.
CO3- Understand the role, structure and importance of the bio molecules associated with plant life.

Core course 8 Code: BO5CRT08
ENVIRONMENTAL SCIENCE AND HUMAN RIGHTS
(Theory 54 hrs; Practical 36 hrs; Credits 3 + 1)

CO1- Acquaint the student with the significance of Environmental Science.
CO2-Make the students aware about the extent of the total biodiversity and the importance of their conservation.
CO3- Help the student to design novel mechanisms for the sustainable utilization of natural resources.
CO4 -Enable the students to understand the structure and function of the ecosystems.
CO5- Enable the students to understand various kinds of pollution in the environment, their impacts on the ecosystem and their control measures
CO6- Make the students aware about various environmental laws in India and the role of various movements in the protection of nature and natural resources.

Open course 2 Code: BO5OPT02
HORTICULTURE AND NURSERY MANAGEMENT
(Theory 72 hrs; Credits 3)

CO1- Understand the importance of horticulture in human welfare.
CO2- Understand the propagation and cultural practices of useful vegetable, fruit and garden plants.
CO3- Understand the impact of modern technologies in biology on horticultural plants.
CO4- Understand the basic concepts of landscaping and garden designing.
CO5- Inculcate interest in landscaping, gardening and flower and fruit culture.

Core course 9 Code: BO6CRT09
GENETICS, PLANT BREEDING AND HORTICULTURE
(Theory 54 hrs; Practical 45 hrs; Credits 3 + 1)

CO1- Imparting an insight into the principles of heredity
CO2- Understand the patterns of inheritance in different organisms
CO3- Understand the inheritance pattern of nuclear and extra nuclear genes
CO4- Understand the methods of crop improvement
CO5- Understand the importance of horticulture in human welfare
CO6- Develop skill in gardening technique among students

Core course 10 Code: BO6CRT10
CELL AND MOLECULAR BIOLOGY
(Theory 54 hrs; Practical 36 hrs; Credits 3 + 1)

CO1- Understand the ultra structure and functioning of cell in the sub-microscopic and molecular level.
CO2- Get an idea of origin, concept of continuity and complexity of life activities.
CO3- Familiarization of life processes.
CO4- Understand the basic and scientific aspect of diversity.
CO5- Understand the cytological aspects of growth and development.
CO6- Understand DNA as the basis of heredity and variation.

Core course 11 Code: BO6CRT11
ANGIOSPERM MORPHOLOGY, TAXONOMY AND ECONOMIC BOTANY
(Theory 72 hrs; Practical 45 hrs; Credits 3 + 1)

CO1- Acquaint with the aims, objectives and significance of taxonomy.
CO2- Identify the common species of plants growing in Kerala and their systematic position.
CO3- Develop inductive and deductive reasoning ability.
CO4- Acquaint with the basic technique in the preparation of herbarium.
CO5- Familiarizing with the plants having immense economic importance.

Core course 12 Code: BO6CRT12
BIOTECHNOLOGY AND BIOINFORMATICS
(Theory 54 hrs; Practical 36 hrs; Credits 3 + 1)

CO1- Understand the current developments in the field of Biotechnology and Bioinformatics.
CO2- Equip the students to carry out plant tissue culture.
CO3- Introduce the vast repositories of biological data knowledge.
CO4- Equip to access and analyze the data available in the databases.

Programme elective course 2 Code: BO6PET02
PLANT GENETIC RESOURCES MANAGEMENT
(Theory 54 hours; Credit 3)

CO1- Acquaint the student with the history and evolution of crop plants, and their diversity.
CO2- Familiarize the student with the available plant genetic wealth and the measures adopted for the conservation of these resources.
CO3- Help the student to identify the crop plants and their wild relatives.
CO4- Help the student to explore the potentialities of various underutilized plants to project as the future food prospects.
CO5- Understand the significance of modern technology to locate the distribution of endangered species.

Complementary course 1 Code: BO1CMT01
CRYPTOGAMS, GYMNOSPERMS AND PLANT PATHOLOGY
(Theory 36 hrs; Practical 36 hrs; Credits 2 + 1)

CO1- Acquire fundamental knowledge in plant science and to make the student to understand that Botany is an integral part of the human life and developments.

CO2- Foster and encourage an attitude of curiosity, appreciation and enquiry of various life forms of plants.

CO3- Understand the identifying characters of the different types included in the syllabus.

CO4-Understand the diversity of plants with respect to Algae, Fungi, Lichens, Bryophytes, Pteridophytes and Gymnosperms.

Complementary course 2 Code: BO2CMT02
PLANT PHYSIOLOGY
(Theory 36 hrs; Practical 36 hrs; Credits 2 + 1)

CO1- Make the students realize the importance of all physiological processes which take place in plants.

CO2- Understand the mechanism of various physiological processes related to plant life.

Complementary course 3 Code: BO3CMT03
ANGIOSPERM TAXONOMY AND ECONOMIC BOTANY
(Theory 54 hrs; Practical 36 hrs; Credits 3 + 1)

CO1- Acquaint the student with the objectives and components of Taxonomy.

CO2- Help the student to understand the systems of classification of angiosperms.

CO3- Help the student to identify the common angiosperm species of Kerala.

CO4- Familiarize the student with plants of immense economic importance.

Complementary course 4 Code: BO4CMT04
ANATOMY AND APPLIED BOTANY
(Theory 54 hrs; Practical 36 hrs; Credits 3 + 1)

CO1- Understand different types of plant tissues.

CO2- Understand the internal structure of different plant organs with reference to their functions.

CO3- Understand the process of normal and anomalous secondary thickening in plants.

CO4- Know the morphological and anatomical adaptations of plants growing in different habitats.

CO5- Understand how botanical knowledge could be applied for crop improvement.

THE LEARNING OUTCOME FRAME OF UG & PG COURSES

DEPARTMENT OF CHEMISTRY

PO, PSO AND CO OF UG CHEMISTRY

According to UGC guidelines. The chemistry graduates are expected to know the fundamental concepts of chemistry and applied chemistry. These fundamental concepts would reflect the latest understanding of the field, and therefore, are dynamic in nature and require frequent and time-bound revisions.

- **Communication skills:** Chemistry graduates are expected to possess minimum standards of communication skills expected of a science graduate in the country. They are expected to read and understand documents with in-depth analyses and logical arguments. Graduates are expected to be well-versed in speaking and communicating their idea/finding/concepts to wider audience.

- **Critical thinking:** Chemistry graduates are expected to know basics of cognitive biases, mental models, logical fallacies, scientific methodology and constructing cogent scientific arguments.

- **Psychological skills:** Graduates are expected to possess basic psychological skills required to face the world at large, as well as the skills to deal with individuals and students of various sociocultural, economic and educational levels. Psychological skills may include feedback loops, self-compassion, self-reflection, goal-setting, interpersonal relationships, and emotional management.

- **Problem-solving:** Graduates are expected to be equipped with problem-solving philosophical approaches that are pertinent across the disciplines.

- **Analytical reasoning:** Graduates are expected to acquire formulate cogent arguments and spot logical flaws, inconsistencies, circular reasoning etc.

- **Research-skills:** Graduates are expected to be keenly observant about what is going on in the natural surroundings to awake their curiosity. Graduates are expected to design a scientific experiment through statistical hypothesis testing and other a priori reasoning including logical deduction.

- **Teamwork:** Graduates are expected to be team players, with productive co-operations involving members from diverse socio-cultural backgrounds.

- **Digital Literacy:** Graduates are expected to be digitally literate for them to enroll and increase their core competency via e-learning resources such as MOOC and other digital tools for lifelong learning. Graduates should be able to spot data fabrication and fake news by applying rational skepticism and analytical reasoning.

- **Moral and ethical awareness:** Graduates are expected to be responsible citizen of India and be aware of moral and ethical baseline of the country and the world. They are expected to define their core ethical virtues good enough to distinguish what construes as illegal and crime in Indian constitution. Emphasis be given on academic and research ethics, including fair Benefit Sharing, Plagiarism, Scientific Misconduct and so on.

- **Leadership readiness:** Graduates are expected to be familiar with decision-making process and basic managerial skills to become a better leader. Skills may include defining objective vision and mission, how to become charismatic inspiring leader and so on.

Program outcome	To demonstrate a systematic, extensive and coherent knowledge and understanding of academic fields of study as a whole and its applications and links to disciplinary areas of the study; including critical understanding of the established theories, principles and concepts of a number of advanced and emerging issues in the field of chemistry;

BSc CHEMISTRY	
PO1:	To demonstrate procedural knowledge that creates different types of professionals in the field of chemistry. Further application of knowledge can enhance productivity of several economically important product. Knowledge of Chemistry is also necessary for the development and management of industry, manufacturing of fine chemicals.
PO2:	Developing skills and ability to use knowledge efficiently in areas related to specializations and current updates in the subject
PO3:	Demonstrate comprehensive knowledge about chemistry, current research, scholarly and professional literature of advanced learning areas of Chemistry.
PO4:	Communicate the results of studies in the academic field of Chemistry using main concepts, constructs and techniques
PO5:	Apply one's knowledge and understanding of Chemistry to new/unfamiliar contexts and to identify problems and solutions in daily life.

PO6:	To think any apply understanding of the subject of Chemistry, Chemical Sciences in identifying the problems which can be solved through the use of chemistry knowledge.
PO7:	To think of the adopting expertise in chemical sciences and solve the problems of environment, green chemistry, ecology, sustainable development, hunger, etc.

Program Specific outcome	program is designed to provide the students a comprehensive understanding about the fundamentals of chemistry with an objective to cover all the important principles and perspectives of physical, inorganic, organic and analytical chemistry expose the diversified aspects of chemistry where the students experience a broader outlook of the subject. have sound knowledge about the fundamentals and applications of chemical and scientific theories. every branch of science and technology is related to chemistry. easily assess the properties of all elements discovered. apply appropriate techniques for the qualitative and quantitative analysis of chemicals in laboratories and in industries. helps in understanding the causes of environmental pollution and can open up new methods for environmental pollution control. develops analytical skills and problem-solving skills requiring application of chemical principles. acquires the ability to synthesize, separate and characterize compounds using laboratory and instrumentation techniques so that
BSc CHEMISTRY	
PSO1 PHYSICAL CHEMISTRY:	In this program students will learn mathematical concept, significance of states of matter, i.e., gaseous, liquid and solid states, basics of thermodynamics, chemical kinetics, nuclear chemistry, colloidal sols, phase equilibrium, entropy, buffer solutions, phase rule,

	electrochemistry, photochemistry, UV-VIS, IR, Raman, NMR spectroscopies.
PSO2 INORGANIC CHEMISTRY:	Atomic structure Schrodinger wave, de Broglie's Equation, Ionic, covalent, coordinate bonds, periodic table covering s, p, d, and f block elements, periodic properties. Chemical properties, theories of coordination compounds like Werner, VBT, CFT & MOT. Bioinorganic chemistry nitrogen fixation, concept of hard & soft acids and bases gravimetric analysis. Inorganic polymers, Errors, Magnetic & spectral properties of complexes, Orgel energy level diagrams.
PSO3 ORGANIC CHEMISTRY:	Reaction mechanism electrophilic, nucleophilic substitutions and additions, methods of preparations, important physical and chemical properties, saturated &unsaturated hydrocarbons, structure and substitution reactions of benzene, alcohols, phenols, aldehydes, ketones, carboxylic acids, acid derivatives like acid chlorides, amides, anhydrides, ammines. Electromagnetic & IR spectroscopy, organic compounds of nitrogen, Carbohydrates nucleic acids i.e., DNA & RNA, fats, oils, and detergents, Organometallic compounds
PSO4: LABORATORY COURSE: CHEMISTRY PRACTICAL	Determination of melting point, boiling point, Weighing and preparation of solution, surface tension, viscosity, Crystallization, Sublimation, Verification of Beer's-Lambert law. Job's method etc.
	Detection of elements, Identification of functional group, organic compound, separation of organic compounds, preparation
	Inorganic mixture analysis, interfering radical, Separation of cations by paper and thin chromatography, volumetric & gravimetric analysis preparation of complexes

B. Sc. First Year

Course outcome *On completion of this course, successfully students will be able to learn:*

Title of the paper

FIRST PAPER -PHYSICAL CHEMISTRY	
CO1:	Simple mathematics, derivation of some chemical equations like order of reaction.
CO2:	Properties of gases and velocity of gas molecules. Solids, Geometry of crystals, liquid crystals, important applications.
CO3:	Chemical Kinetics scope, determination of rate of reaction, factors affecting.
CO4:	Understanding phenomena of Radioactivity, theory of nuclear fission and fusion, half-life period and its applications.
CO5:	Chemical equilibrium, Law of mass action, Colloidal Sols their classification, important properties like kinetic, optical, and electrical, coagulation, Hardy Schultz rule, gold number.
SECOND PAPER -INORGANIC CHEMISTRY	
CO1:	Atomic orbitals, shape of orbitals and rules for filling of electron in orbitals. Screening effect.
CO2:	Periodic properties, factors affecting them, and methods of their evaluation.
CO3:	Valence Bond Theory, VSEPR theory, Molecular Orbital theory. Born-Haber cycle, Covalent nature in ionic bond by Fazan's rule, Metallic bond.
CO4:	Chemistry of noble gases and its compounds.
CO5:	's' and 'p' block elements, function of s block elements in bio-system and binary compounds Diborane, higher boranes, borazines, fullerenes and interhalogen compounds, poly-halides.
THIRD PAPER -ORGANIC CHEMISTRY	
CO1:	Hybridization, bond length, bond angles, bond energy, Resonance hyperconjugation, inductive, electrometric, mesomere, and steric effects.
CO2:	Homo- and heterolytic bond fission, electrophiles & nucleophiles,

CO3:	Hydrocarbon's preparation, properties & uses. Important reactions- Wurtz, Kolbe, Diels- Alder. Chloroform, carbon tetrachloride preparation, properties electrophilic and nucleophilic substitutions (SN1 &SN2).
CO4:	Stereochemistry- optical isomerism properties, Di stereoisomers, resolution of enantiomers, inversion, retention, and racemization.
CO5:	Relative and absolute configuration, sequence rule, D&L and R&S systems of nomenclature. Geometrical Isomerism, determination of configuration of geometrical isomers, E & Z system of nomenclature.

LABORATORY COURSE: CHEMISTRY PRACTICAL

CO1:	✓ Determination of melting point ✓ Determination of boiling point ✓ Weighing and preparation of solution
CO2:	✓ Determination of surface tension/percentage composition or given liquid mixture using surface tension method. ✓ Determination of viscosity/ percentage composition of given liquid mixture using viscosity method.
CO3:	✓ Inorganic mixture analysis Mixture analysis for 2 cation and 2 anions ✓ Separation of cations by paper chromatography
CO4:	✓ Crystallization ✓ Sublimation ✓ Detection of elements
CO5:	✓ Identification of functional group

B. Sc. Second Year

Course outcome	*On completion of this course, successfully students will be able to learn:* ***Title of the paper***
FIRST PAPER -PHYSICAL CHEMISTRY	
CO1:	Thermodynamic terms, second and third law of thermodynamics, Carnot cycle, entropy, Nernst heat theorem, Gibbs(G) & Helmholtz (A) functions Thermochemistry; enthalpy, Hess's law of constant heat summation, heat of reaction, buffer action, Henderson-Hazel equation.
CO2:	Phase rule and electrochemistry, solid solutions, liquid-liquid mixtures, Raoult's, Henry's, and Nernst law with their applications.
CO3:	Basics of electrochemistry
CO4:	Types of electrodes, electrolytic and galvanic cells.
CO5:	Surface Chemistry, Adsorption, Catalysis
SECOND PAPER -INORGANIC CHEMISTRY	
CO1:	Chemistry of first transition series elements.
CO2:	Chemistry of second and third transition series elements.
CO3:	Coordination compounds, Oxidation and Reduction
CO4:	Chemistry of lanthanides and actinides
CO5:	Acids and Bases, Non aqueous solvents
THIRD PAPER -ORGANIC CHEMISTRY	
CO1:	Electromagnetic spectrum: UV and IR spectroscopy
CO2:	Nomenclature and chemistry associated with monohydric, dihydric and trihydric alcohols oxidative cleavage, pinacol-pinacolone rearrangement. Nomenclature, preparation methods, reaction mechanisms for acetylation, carboxylation, Fries rearrangement, Gattermann synthesis, Hauben-Hoesch, Lederer-Manasse and Reimer-Tiemann reactions Phenols: Nomenclature and chemistry, structure and bonding
CO3:	Preparation, properties of aldehydes and ketones. Knoevanagel, Gattermann -

	Koch, Cannizaro, Rosenmund, Perkin, Wittig, Reformatsky, Mannich, and Diels-Alder
CO4:	Chemistry of Carboxylic acids, preparation of Lactic, tartaric, citric acids and their important chemical properties. Ethers: nomenclature, preparation and properties
CO5:	Organic compounds of nitrogen: nitro alkanes, nitro arenes, halo nitro arenes

LABORATORY COURSE: CHEMISTRY PRACTICAL

CO1:	✓ Analysis of inorganic mixture containing five radicals with at least on interfering radical. ✓ Determination of acetic acid in commercial vinegar using NaOH. ✓ Redox titrations. ✓ Estimation of hardness of water by EDTA.
CO2:	✓ Determination of transition temperature of given substance by thermometric method. ✓ To determine the enthalpy of neutralization of strong acid, strong base. ✓ Verification of Beer's-Lambert law. ✓ To study the phase diagram of two component system by cooling curve method.
CO3:	(i) Identification of an organic compound through the functional group analysis, determination of melting point and preparation of suitable derivatives. (ii) Use of Paper chromatography/Thin layer chromatography: determination of R_f values, separation and identification of organic compounds. a. Separation of green leaf pigments (spinach leave may be used) b. Separation of dyes

B. Sc.Third Year

Course outcome *On completion of this course, successfully students will be able to learn:*

Title of the paper

FIRST PAPER -PHYSICAL CHEMISTRY	
CO1:	Elementary Quantum Mechanics, postulates of quantum mechanics, particle in a one-dimensional box. Molecular orbital theory, Introduction to valence bond model of H_2 ion, comparison of M.O. and V.B. models.
CO2:	Spectroscopy-Introduction, Rotational Spectrum, Vibrational Spectrum
CO3:	Raman Spectrum, Electronic Spectrum, UV Spectroscopy
CO4:	Photochemistry
CO5:	Physical Properties and Molecular Structure
SECOND PAPER -INORGANIC CHEMISTRY	
CO1:	Hard and Soft Acids and Bases (HSAB), Silicones and Phosphagens
CO2:	Metal Ligand Bonding in Transition Metal Complexes, Thermodynamic and Kinetic Aspects of Metal Complexes.
CO3:	Magnetic Properties of Transition Metal Complexes,
CO4:	Electronic Spectra of Transition Metal Complex, Organometallic Chemistry
CO5:	Bio-Inorganic Chemistry, Metal Nitrosyl Complex
THIRD PAPER -ORGANIC CHEMISTRY	
CO1:	Spectroscopy: Nuclear Magnetic Resonance Spectroscopy.
CO2:	Organo-Metallic compounds: Organo-magnesium compounds, Organo-Sulphur compounds, Organic synthesis by enolates:
CO3:	Carbohydrates, Fat, Oil and Detergents
CO4:	Amino Acid, Peptide, Protein and nucleic acid, Synthetic dyes

CO5:	Introduction of pyrrole, furan, thiophene and pyridine, Introductory idea about five-and six-membered condensed heterocyclic compounds

LABORATORY COURSE: CHEMISTRY PRACTICAL

CO1:	✓ Gravimetric analysis: o Barium as Barium sulphate, Copper as cuprous-thiocyanate. ✓ Complex compound preparation ✓ Potassium chlorochromate (IV) ✓ Tetramine copper (II) sulphate monohydrate ✓ Hexa ammine nickel (II) chloride ✓ Effluent water analysis, Identification of cations and anions in different samples. ✓ Water analysis, to determine dissolved oxygen in water samples in ppm.
CO2:	✓ To determine the velocity constant (specific reaction rate) of hydrolysis of methyl acetate/ethyl acetate catalyzed by hydrogen ions at room temperature. ✓ Determination of partition coefficient of iodine between carbon tetra chloride and water. ✓ Job's method. ✓ pH-metric titrations, conductometric titrations.
CO3:	✓ binary mixture analysis containing two solids: separation, identification and preparation of derivatives ✓ preparation ✓ acetylation, (ii) Benzoylation, (iii) Meta dinitro benzene (iv) Picric acid

Program outcome

Program is designed to provide the students a comprehensive understanding about the awareness and sense of responsibilities towards environment, apply knowledge to build up small scale industry for developing endogenous product, various aspects of chemistry in natural products isolations, pharmaceuticals, dyes, textiles, polymers, petroleum products, forensic etc. And also, to develop interdisciplinary approach of the subject. so that students will be able to use this knowledge in advancement of their career.

MSc CHEMISTRY	
PO1:	Demonstrate and apply the fundamental knowledge of the basic principles in various fields of Chemistry
PO2:	It would help students to collaborate effectively on team-oriented projects in the field of Chemistry or other related fields.
PO3:	It would help students to communicate scientific information in a clear and concise manner both orally and in Writing.
PO4:	It would help students to inculcate logical thinking to address a problem and become result oriented with a positive attitude
PO5:	It would help students to Have developed their critical reasoning, judgment and communication skills.
PO6:	Augment the recent developments in the field of green and eco-friendly reactions, pharmaceutical, supramolecular, Bioinorganic Chemistry and relevant fields of research and development
PO7:	It would help students to apply the knowledge to develop the sustainable and eco-friendly technology in Industrial Chemistry.
PO8:	It would help students to enhance the scientific temper among the students so as to develop a research culture and implementation of the policies to tackle the burning issues at global and local level.

M. Sc. Chemistry: Program Outcome

Program Specific Outcome

Program Specific outcome	program is designed to provide the students a comprehensive understanding about the fundamentals of chemistry with an objective to cover all the important principles and perspectives of physical, inorganic, organic and analytical chemistry expose the diversified aspects of chemistry where the students experience a broader outlook of the subject. have sound knowledge about the fundamentals and applications of chemical and scientific theories. so that students will be able to use this
MSc CHEMISTRY	
PSO1:	Chemical bonding theories i.e. Valence Bond Theory, Crystal Field Theory, and Molecular Orbital Theory, mechanism of nucleophilic substitution SN1 &SN2 for octahedral and square planar geometries. spectroscopic techniques like IR, Raman, NMR, ESR, Mass, Mossbauer spectroscopy and their applications. Correlation between vibrational spectroscopy and group theory. Bioinorganic chemistry structure and functioning of metalloenzymes and metalloproteins. Students will learn structure and bonding of metal carbonyls, metal nitrosyls and chemistry of Boranes, their nomenclature. Structure and bonding of dioxygen complexes
PSO2:	Aromaticity, antiaromaticity, homoaromatic, stereochemistry, conformational analysis in mechanisms involved, nucleophilic and electrophilic substitution and elimination type of reactions, basic principles, instrumentation and applications of spectroscopic techniques i.e., IR, Raman, NMR, ESR, UV-VIS and Mass for characterization, Photochemical reactions, Pericyclic Reactions, Elimination reactions,

	chemistry involved in functioning of enzymes
PSO3:	Basic principle and applications of Quantum Mechanics. Schrödinger Wave Equation, Approximation methods, angular moments, laws of thermodynamics, classical dynamics and applications. Adsorption phenomenon, capillary action, equations like Laplace and Kelvin and electrokinetic phenomenon. Electrochemistry, Debye-Huckle-Onsager treatment and Lipmann electro capillary phenomenon, solid state chemistry application, crystal defects, homo& heterogeneous catalysis, metallic bonds, conductors, semiconductors, NMR&ESR spectra Theory of photochemistry and phenomena like phosphorescence, fluorescence and their applications
PSO4:	Microwave, infrared, Raman and electronic spectroscopy. Basics of pure mathematics algebra, differential & integral calculus, probability, permutation, topics of biology i.e., structure and functions of cell, chemistry of lipids, fats, amino acids. Analytical Chemistry, statistical analysis, types and minimization of errors, accuracy and precision. Separative techniques like chromatography, Photoelectron spectroscopy, X-Ray, Electron &Neutron Diffraction. Biopolymers, thermodynamics and transport of biopolymeric ions.
PSO6: **LABORATORY COURSE: CHEMISTRY PRACTICAL**	Use modern techniques, handling equipment's, qualitative and quantitative analytical skills. Acquires the ability to synthesize, separate and characterize compounds using laboratory and instrumentation techniques. Carry out experiments in the area of organic analysis, estimation, separation, derivative process, inorganic semi micro analysis, preparation, conductometric, spectrophotometry, chemical kinetics, electronics, molecular modelling, Polarimetry, pH meter and potentiometric analysis etc.

Course Outcome

This program is designed with an objective to cover all important topics of physical, inorganic, organic and analytical branches so that students will be able to use this knowledge in advancement of their career.

M. Sc. First Semester

Course outcome	*On completion of this course, successfully students will be able to learn:* *Title of the paper*
FIRST PAPER (MCH 101) INORGANIC CHEMISTRY	
CO1:	Stereochemistry, bonding, VSEPR theory, MO treatment
CO2:	Reaction mechanism of Substitution inertness and lability
CO3:	Electronic spectra of transition metal complexes
CO4:	Metal carbonyls, Dioxygen Complexes
CO5:	Wilkinson's Catalyst, borane chemistry including topology, nomenclature, reactivity and bonding.
SECOND PAPER (MCH102) ORGANIC CHEMISTRY	
CO1:	Structure and bonding in organic molecules
CO2:	Aromaticity, antiaromaticity, homo aromaticity including weaker bonds.
CO3:	Stereochemistry, symmetry, chirality, optical activity and conformational analysis,
CO4:	Reaction mechanism, Hammett equation, SN1, SN2 and SET mechanism,
CO5:	UV-VIS, ORD &CD Spectroscopy.
THIRD PAPER (MCH 103) PHYSICAL CHEMISTRY	
CO1:	Schrodinger Wave equation, variation and perturbation theory,
CO2:	Classical thermodynamics,
CO3:	Phase rule, chemical dynamics, Arrhenius Equation,
CO4:	Theory of reaction rate and application of rate law on dynamic chain reaction

CO5:	Reaction catalysts.
FOURTH PAPER (MCH104) SPECTROSCOPY	
CO1:	Electromagnetic spectrum
CO2:	Microwave spectroscopy
CO3:	Infrared Spectroscopy
CO4:	Raman and Electronic spectroscopy.
CO5:	CARS (Coherent and Stokes Raman Spectroscopy) and application of these spectral techniques in structure determination of molecule.
FIFTH PAPER (MCH 105 A) MATHEMATICS FOR CHEMIST	
CO1:	Basic concept of mathematical technique involved in Chemistry like Mathematics Algebra
CO2:	Differential calculus, integral calculus,
CO3:	Elementary differential equation
CO4:	Permutation
CO5:	Probability.
FIFTH PAPER (MCH 105 B) BIOLOGY FOR CHEMIST	
CO1:	Cell structure
CO2:	Cell organs, and their function
CO3:	Carbohydrates,
CO4:	Lipids and fats, amino acids
CO5:	Nucleic acids.
LABORATORY COURSE: CHEMISTRY PRACTICAL	
COURSE MCH 106: INORGANIC CHEMISTRY	
CO1:	Qualitative and Quantitative Analysis
CO2:	Chromatography
CO3:	Preparations- Preparation of selected inorganic complexes and their studies by measurements of decomposition temperature, molar conductance, IR and electronic spectra.

COURSE MCH 107: ORGANIC CHEMISTRY	
CO1:	Qualitative Analysis: Separation, purification and identification of compounds of binary mixture. Emphasis should be placed on physical principles, reaction chemistry and the technique involved in analysis.
CO2:	Organic Synthesis-Purification of compounds by TLC and column chromatography.
CO3:	Aromatic electrophilic substitutions, Reduction reaction
CO4:	Quantitative Analysis-*Determination of the percentage or number of hydroxyl groups in an organic compound by acetylation method*

COURSE MCH 108: PHYSICAL CHEMISTRY	
CO1:	Adsorption
CO2:	Phase Equilibria
CO3:	Chemical Kinetics
CO4:	Solutions

M. Sc. Second Semester

Course outcome	*On completion of this course, successfully students will be able to:* ***Title of the paper***

FIRST PAPER (MCH 201) INORGANIC CHEMISTRY	
CO1:	Metal ligand equilibrium, reaction mechanism, base hydrolysis, conjugate base mechanism in octahedral and mechanism of square planar complexes.
CO2:	Metal-ligand bonding
CO3:	Calculations of Dq, B and beta parameters
CO4:	Preparation, properties, structure and applications of metal nitrosyls.
CO5:	Symmetry elements, symmetry operations and the principle involved in group theory.

SECOND PAPER (MCH 202) ORGANIC CHEMISTRY	
CO1:	Mechanism- aromatic/aliphatic electrophilic substitution
CO2:	Free radical, allylic halogenation reaction,
CO3:	Addition to carbon-carbon and carbon-hetero atom multiple bond and aromatic

	nucleophilic substitution, SE1, SE2, SN1 SN2 & SRN1 reactions.
CO4:	ESR Spectroscopy
CO5:	IR and Raman spectra and their application in characterization of organic compounds.
THIRD PAPER (MCH 203) PHYSICAL CHEMISTRY	
CO1:	Chemical dynamics
CO2:	Adsorption and electrokinetic phenomenon,
CO3:	Micellization, DHO equation.
CO4:	Lipmann electro-capillary phenomenon including different models.
CO5:	Macromolecules and colloid including their types, emulsification, irreversible electrode phenomenon including decomposition voltage overlaps.
FOURTH PAPER (MCH 204) SPECTROSCOPY & DIFFRACTION METHODS	
CO1:	Photoelectron spectroscopy, photoacoustic spectroscopy,
CO2:	X ray Diffraction, Neutron Diffraction.
CO3:	Biological cell, constituents,
CO4:	Bioenergetics
CO5:	Thermodynamics of biopolymer solution and transport of ion through the cell membrane.
FIFTH PAPER (MCH 205) COMPUTER FOR CHEMIST	
CO1:	Basic knowledge of computer and computing
CO2:.	BASIC and FORTRAN based programming with especial reference to programming in chemistry.
CO3:	Rerunning of standard program in MS Word and MS Excel
CO4:	Search engines and various types of files like PDF, RTF, JPG
CO5:	OMR & Webcam.
LABORATORY COURSE: CHEMISTRY PRACTICAL	
COURSE MCH 206: INORGANIC CHEMISTRY	
CO1:	Chromatography Separation of cations and anions by Column Chromatography

CO2:	Estimation of Ni – Fe, Ni (Gravimetrically), Fe (Volumetrically)
CO3:	Preparations- Preparation of selected inorganic complexes and their studies by measurements of decomposition temperature, molar conductance, IR and electronic spectra.
CO4:	Interpretation of TG and NMR spectra of some known compounds
COURSE MCH 207: ORGANIC CHEMISTRY	
CO1:	Qualitative Analysis: Separation, purification and identification of compounds of binary mixture. Emphasis should be placed on physical principles, reaction chemistry and the technique involved in analysis.
CO2:	Preparation of phenyl azo – β – naphthol from aniline.
CO3:	Aromatic electrophilic substitutions, Reduction reaction
CO4:	Quantitative Analysis-*Determination of the percentage or number of hydroxyl groups in an organic compound by acetylation method*
COURSE MCH 208: PHYSICAL CHEMISTRY	
CO1:	***Electrochemistry***
CO2:	***Conductometry***
CO3:	***Potentiometry/pH merry***
CO4:	***Polarimetry***

M. Sc. Third Semester

Course outcome	*On completion of this course, successfully students will be able to:* ***Title of the paper***
FIRST PAPER (MCH 301) INORGANIC CHEMISTRY	
CO1:	Group theory, Character tables, orthogonality theorem, applications for C2v and C3v point groups
CO2:	Correlation of vibrational spectroscopy with group theory. They will also understand molecular energy levels and M.O. Diagrams, bonding of multidentate ligands, characterization by IR &Raman spectroscopy.

CO3:	Shift reagents in NMR spectroscopy
CO4:	Structure and functioning of metalloenzymes e.g., carboxypeptidase, carbonic anhydrase
CO5:	Structure and functioning of biomolecules like Hemoglobin.
SECOND PAPER (MCH 302) ORGANIC CHEMISTRY	
CO1:	Basic theory of NMR spectroscopy, applications to characterize organic compounds.
CO2:	Photochemical reactions.
CO3:	Mechanism of pericyclic reaction,
CO4:	Woodword Haffmann, FMO &PMO approach
CO5:	Sigma tropic rearrangements.
THIRD PAPER (MCH 303) PHYSICAL CHEMISTRY	
CO1:	Atomic concepts, Russell-Saunders terms and coupling. Molecular Orbitals, Huckel theory of conjugated systems like ethylene, butadiene
CO2:	Homo and heterogeneous catalysis.
CO3:	Crystal defects. Schottky and Frankel defects
CO4:	Solid state reactions. Metallic bond
CO5:	Conductors, semiconductors, insulators and superconductors
FOURTH PAPER (MCH 304 B) ANALYTICAL CHEMISTRY	
CO1:	Statistical Analysis., Sample Preparation for Chromatography.
CO2:	Chromatography. Theory of Chromatography, Gas Chromatography, High-Performance Liquid Chromatography, Capillary Electrophoresis.
CO3:	Ion Exchange, Solvent Extraction
CO4:	Atomic Absorption Spectrometry, Electrolytic Methods
CO5:	Acid-Base Titrations, Precipitation Titrations, Complexometric Titrations, Redox Titrations.
FIFTH PAPER (MCH 304C) ELECTIVE PAPER: PHOTOCHEMISTRY	

CO1:	Photochemical Reactions
CO2:.	Determination of Reaction Mechanism
CO3:	Photochemistry of Alkene
CO4:	Photochemistry of Carbonyl
CO5:	Miscellaneous Photochemical Reactions, Photo degradation of polymers. Photochemistry of vision.

LABORATORY COURSE: CHEMISTRY PRACTICAL

COURSE MCH 306: INORGANIC CHEMISTRY

CO1:	**Synthesis** Synthesis of selected inorganic compounds and their studies by measurements of decomposition temperatures and molar conductance, magnetic and IR electronic spectra.
CO2:	Qualitative test of suitable anion and determination of metal content gravimetrically in the above compounds.
CO3:	Interpretation of ESR and mass spectra of some known coordination compounds.

COURSE MCH 307: ORGANIC CHEMISTRY

CO1:	**Qualitative Analysis** Separation, purification and systematic identification of the components of a mixture of three organic compounds (solids and liquids). Preparation of one derivative of each compound. Use of TLC for ascertainment of purity of compounds.
CO2:	**Multi-step Synthesis** This exercise should illustrate the use of organic reactions/ diverse conditions and principles for organic synthesis. Purification of compounds by chromatographic techniques.

COURSE MCH 308: PHYSICAL CHEMISTRY

CO1:	Potentiometry
CO2:	Conductivity

CO3:	Spectrophotometry
CO4:	Molecular Modeling

M.Sc. Fourth Semester

Course outcome	*On completion of this course, successfully students will be able to:*
	Title of the paper
FIRST PAPER (MCH 401) INORGANIC CHEMISTRY	
CO1:	ESR Spectroscopy
CO2:	Mossbauer, IR, Raman spectroscopy,
CO3:	Point groups and vibrational spectroscopy.
CO4:	Bio-inorganic chemistry, chlorophyll, photo systems one and two,
CO5:	Metalloproteins cytochromes, iron Sulphur protein, Nitrogen fixation.
SECOND PAPER (MCH 402) ORGANIC CHEMISTRY	
CO1:	^{13}C NMR Spectroscopy
CO2:	Mass spectroscopy.
CO3:	Reaction mechanism of elimination, E1, E2 & E1CB type,
CO4:	Substitution reactions.
CO5:	Enzymes, structure and functioning.
THIRD PAPER (MCH 403) PHYSICAL CHEMISTRY	
CO1:	NMR, ESR spectroscopy.
CO2:	Laws of photochemistry, fluorescence,
CO3:	Steric and conformational properties of molecules,
CO4:	Winstein-Holmer and Curtin-Hammett Equations
CO5:	CO5: Electronic effects involved in SN1 and SN2 type of reactions, and curve crossing model.
FOURTH PAPER (MCH404) POLYMER CHEMISTRY	
CO1:	Basic theory, classification of polymers
CO2:	Characterization, important properties of polymers

CO3:	Commercial importance of polymers
CO4:	Processing to understand different types of casting like die-rotational, film
CO5:	Methods for designing variety of polymers

FIFTH PAPER (MCH 405A) ELECTIVE: CHEMISTRY OF NATURAL PRODUCTS

CO1:	*Terpenoids*
CO2:	*Alkaloids*
CO3:	*Steroids*
CO4:	*Plant Pigments. Carotenoid, Flavonoids, Chlorophyll*
CO5:	*Vitamins and Antibiotics, Antibiotics.*

LABORATORY COURSE: CHEMISTRY PRACTICAL

COURSE MCH 406: INORGANIC CHEMISTRY

CO1:	Spectrophotometric Determination
CO2:	Flame photometric determination
CO3:	Model Experiments on Cyclic Voltammetry
CO4:	Interpretation of ESR, NMR and Thermogravimetric pre-recorded results of known compounds

COURSE MCH 407: ORGANIC CHEMISTRY

CO1:	Multi-step Synthèses - Qualitative & Quantitative
CO2:	Quantitative Analysis
CO3:	Spectral Analysis: Interpretation of pre-recorded UV-Vis, IR, NMR, Mass, Raman spectrum and characterization of one organic compound.

COURSE MCH 408: PHYSICAL CHEMISTRY

CO1:	Spectrophotometry
CO2:	Chemical Kinetics
CO3:	Electronics
CO4:	Molecular Modeling