

## COMMERCE

### B.Com

#### The program:

This program aim to provide students with specific knowledge and skills relevant to their disciplines and careers. This program satisfies the educational entrance requirements for membership of relevant professional bodies. To demonstrate and understanding of the principles of accounting, finance, economic and business law.

#### The program specific outcome:

- To develop numerical abilities of students
- To inculcate writing skills and business correspondence
- To create awareness of law and legalisations related to commerce and business
- To introduce recent trends in business , organisations and industries
- To acquire practical skills related with banking and other business.

### B.Com (computers and generals)

#### PSO: B.com 1<sup>st</sup> year General & Computer, Information Technology, Sem-I

**Objective:** To acquire basic knowledge in information technology and its applications in the area of business.

**Credits:** 3 Theory period of 1 hr per week over a semester.

1 Practical period of 2 hr per week over a semester.

PSO1. Introduction to Computers

PsO2. Operating system

PSO3. Word Processing

PSO4. Spread Sheet

PSO5. Power point presentation

#### PSO: B.com 1<sup>st</sup> year General & Computer, Management information system, Sem-I

**Objective:** To equip the students with finer nuances of MIS.

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. An over view of management information system

PsO2. Foundation of information system

PSO3. Concept of planning and control

PSO4. Business applications of information technology

PSO5. Advanced concepts in information system

**PSO:** B.com 1<sup>st</sup> year General & Computer, Business Organization SEM-I

**Objective:** Acquaint the students with the basics of Commerce and business concepts and functions forms of business organization

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Fundamental concepts

PsO2. Business organization

PSO3. Formation of joint stock company

PSO4. Source of finance

PSO5. Stock exchange and mutual fund.

**PSO:** B.com 1<sup>st</sup> year General & Computer, Principles of Management SEM-II

**Objective:** To aquatint the students with the principles, functions and practice of management.

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Introduction to management

PsO2. Planning

PSO3. Organizing

PSO4. Delegation and decentralization

PSO5. Coordination and control

**PSO:** B.com 1<sup>st</sup> year General & Computer of Foreign Trade, SEM-II

**Objective:** To gain knowledge of India's foreign trade procedures, policies and international institutions

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Introduction to foreign trade

PsO2. Balance of trade and balance of payments

PSO3. Indian trade policy

PSO4. Foreign trade and trade blocks

PSO5. International Economic institutions

**PSO:** B.com 1<sup>st</sup> year General & Computer FINANCIAL ACCOUNTING -1 SEM-I

**Objective:** To acquire conceptual knowledge of basics of accounting and preparation of financial accounts of sole trader.

**Credits:** 5 Theory period of 1 hr per week over a semester

PSO1. Accounting concepts and conventions.

PSO2. Accounting standards issued by ASB

PSO3. Types of accounts, Accounting cycle, Journals, L edges and Trial balance.

PSO4. Subsidiary books Bills receivable books

PSO5. Bank reconciliation statement

**PSO:** B.com 1<sup>st</sup> year General & Computer of financial accounting-II SEM-II

**Objective:** To acquire accounting knowledge of Bills of Exchange and other business accounting methods.

**Credits:** 5 Theory period of 1 hr per week over a semester

PSO1. Bills of Exchange

PSO2. Consignment account

PSO3. Joint venture accounts

PSO4. Accounts from incomplete records

PSO5. Accounting for non- Profit Organization.

**PSO:** B.com 1<sup>st</sup> year General & Computer, Business Economics, SEM-I

**Objective:** To acquire knowledge for application of economic principles and tools in business practices

**Credits:** 5 Theory period of 1 hr per week over a semester

PSO1. Introduction to Business Economics

PSO2. Demand Analysis

PSO3. Supply Analysis

PSO4. Production Analysis

PSO5. Cost and Revenue Analysis

**PSO: B.com 1<sup>st</sup> year General & Computer, Managerial Economics, SEM-I**

**Objective:** To impart conceptual and practical knowledge of Managerial Economics.

**Credits:** 5 Theory period of 1 hr per week over a semester

PSO1. Nature and scope of Managerial economics

PSO2. Demand Forecasting

PSO3. Market Analysis

PSO4. Macro Economics for managers

PSO5. Fiscal and momentary policy

**PSO: B.com 1<sup>st</sup> year General & Computer, Income Tax –I SEM-III**

**Objective:** To acquire conceptual and legal knowledge about Income tax provisions relating to computation of income from different heads with reference to an individual assesses.

**Credits:** 5 Theory period of 1 hr per week over a semester

PSO1. Introduction and Basic Concepts, Residential Status and Scope of Total Income

PSO2. Agricultural Income

PSO3. Income from Salaries

PSO4. Income from House Property

PSO5. Profits and Gains of Business or Profession- I Profits and Gains II –Depreciation

**PSO: B.com 1<sup>st</sup> year General & Computer Income Tax – II SEM-IV**

**Objective:** To acquire conceptual and legal knowledge about Income tax provisions relating to computation of income from different heads with reference to an individual assesses.

**Credits:** 5 Theory period of 1 hr per week over a semester

PSO1. Capital Gains

PSO2. Income from Other Sources

PSO3. Clubbing of Income, Set-Off Carry Forward Of Losses, Deductions  
from Gross Total Income (U/S) 80C to 80U

PSO4. Assessment of Individuals

PSO5. Assessment Procedure

**PSO: B.com 2<sup>nd</sup> year General & Computer Business Statistics-I SEM-III**

**Objectives:** To inculcate analytical and computational ability among the students.

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Introduction to Origin and development of statistics

PSO2. Diagrammatic and graphic presentation

PSO3. Measures of central tendency

PSO4. Measure of dispersion, skeweness and kurtosis

PSO5. Correlation

**PSO: B.com 2<sup>nd</sup> year General & Computer , Business Statistics-II , SEM-IV**

**Objectives:** To inculcate analytical and computational ability among the students.

**Credits:** 4 Theory period of 1 hr per week over a semester.

PSO1. Regression

PSO2. Index Numbers

PSO3. Time series

PSO4. Probability

PSO5. Theoretical Distributions

**PSO: B.com 2<sup>nd</sup> year General & Computer ,Principles of Insurance ,SEM-III**

**Objective:** The objective of course is:

- To provide a basic understating of the insurance mechanism.
- Identify the relationship between insurers and their customers and the importance of insurance contracts.

**Credits:** 2 Theory period of 1 hr per week over a semester

- PSO1. Risk management and Insurance
- PSO2. Insurance Business and Market
- PSO3. Insurance terminology and insurance customers
- PSO4. Insurance contracts
- PSO5. Insurance products C. joint venture d. partnership

**PSO: B.com 2<sup>nd</sup> year General & Computer ,Practice of Life Insurance, SEM-IV**

**Objectives:** The objectives of the course are

- To provide an insight into the different types of Life Insurance Plans
- Enable the students to understand the importance of nomination and assignments.

**Credits:** 2 Theory period of 1 hr per week over a semester

- PSO1. Practice and Plans of Life Insurance
- PSO2. Premiums, Bonuses and Annuities
- PSO3. Group Insurance and linked life insurance policies
- PSO4. Policy Documents and assignments, Nomination and surrenders of policy
- PSO5. Policy claims

**PSO: B.com 2<sup>nd</sup> year General & Computer ,Advanced Accounting SEM-III**

**Objective:** To acquire accounting knowledge of partner firms and joint stock companies

**Credits:** 5 Theory period of 1 hr per week over a semester

- PSO1. Partnership accounts-I
- PSO2. Partnership Accounts-II
- PSO3. Issue of shares, Debentures, Underwriting and Bonus shares
- PSO4. Company final accounts and profit prior to incorporation
- PSO5. Valuation of Goodwill and Shares

**PSO: B.com 2<sup>nd</sup> year General & Computer, Corporate Accounting SEM-IV**

**Objectives:** To acquire knowledge of AS-14 and preparation of accounts of banking and insurance companies

**Credits:** 5 Theory period of 1 hr per week over a semester

PSO1. Company Liquidation

PSO2. Amalgamation (AS-14)

PSO3. internal reconstruction and acquisition of business

PSO4. Accounts of banking companies

PSO5. Accounts of Insurance companies and Insurance claims

**PSO: B.com 2<sup>nd</sup> year General & Computer , Entrepreneurial Development and Business Ethics, SEM-III**

**Objective:** To have exposure to the entrepreneurial culture, development and business ethics to set up and manage small units.

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Introduction to EDB

PSO2. Entrepreneurial development

PSO3. Projects and MSMEs

PSO4. Entrepreneurial development policies and programmes

PSO5. Business ethics

**PSO: B.com 2<sup>nd</sup> year General & Computer ,Financial Statement Analysis ,SEM-IV**

**Objective:** To acquire knowledge and techniques of financial statement analysis.

**Credits:** 5 Theory period of 1 hr per week over a semester

PSO1. Introduction to financial statements

PSO2. Techniques of financial statements analysis

PSO3. Ratio analysis

PSO4. Funds flow analysis

PSO5. Cash flow analysis (AS-3)

**PSO: B.com 2<sup>nd</sup> year General & Computer, Programming with C ,SEM-III**

**Objective:** To gain the skills of structured (Procedural/Functional) programming using C language

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Introduction to C language, data types and I/O operations

PSO2. Operators, Expressions and decision making.

PSO3. Arrays and Strings.

PSO4. Built-in-functions and user- defined functions

PSO5. Structure and Pointers

**PSO: B.com 2<sup>nd</sup> year General & Computer ,objective oriented Programming in C++ ,SEM-IV**

**Objective:** To gain skills of object oriented programming using C++ language.

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Introduction to objective oriented programming

PSO2. Classes, objects, constructors and destructors

PSO3. Overloading, conversions, derived classes and inheritance

PSO4. Polymorphism, virtual function, streams and files

PSO5. Exception handling and data structure in C++

**PSO: B.com 3<sup>rd</sup> year General & Computer, Corporate Accounting-I, SEM-V**

**Objective:** To appraise the students about Need and importance of Accounting Standards, and to impart the Students, Knowledge about Preparation of Company Final Accounts and Accounting Treatment of Corporate Undertakings.

**Credits:** 4 Theory period of 1 hr per week over a semester

1 Practical period of 1 hr per week over a semester

PSO1. Accounting Standards

PSO2. Valuation of Goodwill

PSO3. Valuation of Shares

PSO4. Profit Prior to Incorporation



PSO5. Company accounts

**PSO: B.com 3<sup>rd</sup> year General & Computer ,Corporate Accounting-II, SEM-VI**

**Objective:** To appraise the students about The Application of Accounting Knowledge in preparation of Financial Statements of Insurance and Bank Accounts.

**Credit:** 4 Theory period of 1 hr per week over a semester

1 Practical period of 1 hr per week over a semester

PSO1. Amalgamation and External Reconstruction

PSO2. Internal Reconstruction

PSO3. Accounts of Banking Companies

PSO4. Accounts of Life Insurance

PSO5. Accounts of General Insurance Companies

**PSO: B.com 3<sup>rd</sup> year General & Computer, of Business Contracts-I, SEM-V**

**Objective:** To familiarize the students with statutory provisions relating to general and special contracts.

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Business contracts

PSO2. Consideration and capacity to contract

PSO3. Consent

PSO4. Legality of object and consideration

PSO5. Discharge and breach of contract

**PSO: B.com 3<sup>rd</sup> year General & Computer, Business Contracts-II ,SEM-VI**

**Objective:** To introduce the students to the statutory provisions that effects the business decisions.

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Sale of goods act 1930

PSO2. Consumer protection act 1986

PSO3. Intellectual property rights

PSO4. Company law

PSO5. Winding up of a company

**PSO: B.com 3<sup>rd</sup> year General & Computer, Auditing, SEM-V**

**Objective:** To impart knowledge to students pertaining to basic concepts of auditing.

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Introduction to auditing

PSO2. Qualification of an Auditor

PSO3. Planning of Audit

PSO4. Planning of Control

PSO5. Vouching

**PSO: B.com 3<sup>rd</sup> year General & Computer, Institutional and Business Reports, SEM-VI**

**Objectives:** To acquaint students with auditing procedure and Report writing.

**Credits:** 4 Theory period of 1 hr per week over a semester

PSO1. Audit of Financial institution

PSO2. Audit of Institution

PSO3. Audit Report

PSO4. Report Writing

PSO5. Business Reports

**PSO: B.com 3<sup>rd</sup> year General & Computer, Cost and Management Accounting-I, SEM-V**

**Objectives:** To impart conceptual knowledge of cost and management accounting. To train the students in finding the cost of products using Different methods of costing.

**Credits:** 4 Theory period of 1 hr per week over a semester

1 Practical period of 1 hr per week over a semester

PSO1. Introduction to cost and management accounting

PSO2. Material cost

PSO3. Labour cost

PSO4. Overheads

PSO5. Methods of costing

**PSO: B.com 3<sup>rd</sup> year General & Computer, Cost and Management Accounting-II, SEM-VI**

**Objectives:** To equip basic skills of analysis of financial information to be useful to the management.

**Credits:** 4 Theory period of 1 hr per week over a semester

1 Practical period of 1 hr per week over a semester

PSO1. Process costing

PSO2. Managerial costing and Break even Analysis

PSO3. Budgeting and standard costing

PSO4. Financial statement analysis

PSO5. Cash flow analysis

**PSO: B.com 3<sup>rd</sup> year General & Computer, Advanced Corporate Accounting-I, SEM-V**

**Objectives:** To enable students to prepare financial statements of holding and Subsidiary accounts. To enable students to prepare financial statements of electricity companies.

**Credits:** 4 Theory period of 1 hr per week over a semester

1 Practical period of 1 hr per week over a semester

PSO1. The Accounts of Holding companies

PSO2. The Accounts of subsidiary companies

PSO3. Accounts of Electricity companies

PSO4. Electricity supply act 1948 and the companies Act 1956

PSO5. Lease accounting

**PSO: B.com 3<sup>rd</sup> year General & Computer, Advanced Corporate Accounting-I, SEM-VI**

**Objectives:** To enable students to prepare financial statements in case of

Liquidation of companies. To provide the knowledge of human resources and social responsibility accounting and preparing final accounts using Accounting packages.

**Credits:** 4 Theory period of 1 hr per week over a semester

1 Practical period of 1 hr per week over a semester

PSO1. Introduction to Human Resources Accounting

PSO2. Methods of Human Resources Accounting

PSO3. Social Responsibility Accounting

PSO4. Liquidation of Companies

PSO5. Liquidators final statement of account

**PSO: B.com 3<sup>rd</sup> year General & Computer, Management Accounting-I,**

#### **SEM-V**

**Objectives:** The objective of this paper is to familiarize the students with the tools and skills of decision making in management accounting.

**Credits:** 4 Theory period of 1 hr per week over a semester

1 Practical period of 1 hr per week over a semester

PSO1. Introduction to Management Accounting

PSO2. Management accounting system and MIS

PSO3. Financial Statement Analysis

PSO4. Techniques of Financial statement analysis

PSO5. Introduction to Ratio analysis

**PSO: B.com 3<sup>rd</sup> year General & Computer, Management Accounting-II, SEM-VI**

**Objectives:** The objective of this paper is to familiarize the students with the tools and skills of decision making in management accounting.

**Credits:** 4 Theory period of 1 hr per week over a semester

1 Practical period of 1 hr per week over a semester

PSO1. Ratio Analysis – Computation and interpretation

PSO2. Funds flow Analysis

PSO3. Cash flow Analysis

PSO4. Capital Budgeting

PSO5. Techniques of capital Budgeting

**PSO: B.com 3<sup>rd</sup> year General & Computer ,Fundamentals of E- commerce-II, SEM-V**

**Objectives:** To enable the students to understand the fundamentals of E-commerce

**Credits:** 3 Theory period of 1 hr per week over a semester.

1 Practical period of 2 hr per week over a semester

PSO1. E- Commerce

PSO2. Impact of E-Commerce

PSO3. E-Commerce and WWW Architecture

PSO4. Security and the Web- Security

PSO5. Consumer oriented E- Commerce

**PSO: B.com 3<sup>rd</sup> year General & Computer ,Fundamentals of E- commerce-II, SEM-VI**

**Objectives:** To enable the students to understand the fundamentals of E-commerce.

**Credits:** 3 Theory period of 1 hr per week over a semester.

1 Practical period of 2 hr per week over a semester

PSO1. E- Payment systems

PSO2. Electronic Data Interchange Applications in Business

PSO3. EDI security and privacy Issues in E-Commerce

PSO4. Web based Marketing

PSO5. Advertising and Marketing on the Internet

**PSO: B.com 3<sup>rd</sup> year General & Computer , of Web Programming-I, SEM-V**

**Objectives:** To enhance the dynamic functionality using client – side and server – side scripting — In VB script.

**Credits :** 4 Theory period of 1 hr per week over a semester

1 Practical period of 2 hr per week over a semester

PSO1. Introduction to HTML Programming

PSO2. Formatting text

PSO3. Introduction to Dynamic HTML Programming

PSO4. Dynamically changing style, text, Graphics and Placements

PSO5. Introduction to Extensible Mark up Language

**PSO: B.com 3<sup>rd</sup> year General & Computer , of Web Programming-I,SEM-VI**

**Objectives:** To enhance the dynamic functionality using client – side and server – side scripting – In VB script.

**Credits:** 4 Theory period of 1 hr per week over a semester

1 Practical period of 2 hr per week over a semester

PSO1. Introduction to VB script

PSO2. User Interaction in VB script

PSO3. Introduction Active server pages (ASP)

PSO4. ASP Objects

PSO5. Hyperlinks in XML documents

### **BBA 1st Year Sem -1**

#### **PSOs and COs of Principles of Management**

**Objectives:** The general objective of this course is to provide a broad and interactive introduction to the theories and practice of management. In particular, the courses focuses on the basic areas of the management process and functions from an organizational view point

**Credits:** 5

PSO1. Introduction to management

PSO2. Planning

PSO3. Organising

PSO4. Staffing

PSO5. Emerging issues in Management

#### **PSOs and COs of Basics of Marketing**

**Objectives:** To provide an exposure to the students pertaining to nature and scope of marketing, which they are expected to possess when they enter the industry as practitioners.

**Credits: 5**

PSO1. Introduction of Marketing

PSO2. Market segmentation, Target market and product positioning

PSO3. New product Development

PSO4. Product and pricing decisions

PSO5. Promotion mix

### **PSOs and COs of Business Economics**

**Objectives:** The purpose of this course is to apply micro economic concepts and tools for analyzing business problems and making accurate decisions pertaining to the business firms.

**Credits: 5**

PSO1. Business Economic nature and scope

PSO2. Demand concepts and elasticity of Demand

PSO3 Production and cost concepts

PSO4. Budget line

PSO5. Market structures and pricing

### **BBA 1st Year Sem -II**

### **PSOs and COs of Organizational behaviour**

**Objectives:** The main objective is to explain the fundamentals of managing business and to understand individual and group behaviour at work place so as to improve the effectiveness of an organization.

**Credits: 5**

PSO1. Organizational Behaviour

PSO2. Motivation

PSO3. Group Dynamics

PSO4. Management of Change

PSO5. Organization Culture, Conflict and effectiveness

### **PSOs and COs of Business Statistics**

**Objectives:** The objective of this course is to provide a student an understanding of basic statistical tools to apply for management problems and

Analysis. The tools starting from data gathering, tabulation presentation and analyzing using basics statistical techniques.

**Credits:** 5

PSO1. Introduction to statistics

PSO2. Measures of central tendency

PSO3. Index Numbers

PSO4. Probability, Sampling

PSO5. Correlation analysis

### **PSOs and COs of Business Law**

**Objectives:** The objective is to introduce the students to various regulations affecting business and to familiarize the students with regulation relating to business.

**Credits:** 5

PSO1. Introduction to Business Laws

PSO2. Contract Laws

PSO3. Information Laws and RTE

PSO4. Computation and consumer laws

PSO5. Economic and environmental laws- FEMA 1999

### **ARTS**

#### **Objectives for B.A**

Bachelor of Arts teaches about the world in which we live and how we might live in future. It helps the students to learn the various tools and methods of economic analysis the nature and central problems of an economy, market structure to understand the basic concepts and fundamental structure of the market with advance knowledge., theory to the real events and issues and to make active use of the economic principles to the economy , role of the monetary policies for the economic development and make them to understand the regulation of the money supply and the control of cost and availability of



credit by central bank of the country through the use of deliberate and discretionary action for achieving objectives of general economic policy.

Study the Bachelor of Arts will help to understand basic ideas and concepts in Political Science such as history, Economics, Sociology, Liberal Approach, Marxist Approach, Behaviouralism and Post Behaviouralism, Divine Origin Theory, Evolutionary Theory, Social Contract Theory, Theories and kinds of Rights, Human Rights, State and Sovereignty, Nation and Civil Society, Monism, Pluralism, Indian Government and politics, Indian constitution, western and Indian political thinkers, International relations. World trade, communications, development, foreign investment, and international finance, policy decisions, National security policy, nuclear deterrence, arms control and defence spending decisions are typical examples of foreign policy decisions.

Understand public administration theory and concepts from multiple perspectives, Acquaint with the functioning of the Indian administration, at central, state and local levels and the responses of these systems in addressing the concerns of the people, India's development experience and changing role of administration, Understand the interface of theory and practice in Public Administration, Develop conceptual, analytical and problem solving abilities among the learners, administrative science and government in action and the contemporary issues in public affairs management .

### **BA 1st Year Sem -I**

#### **Economics paper-I micro economics**

#### **PSOs and COs of theory of consumer and producer behaviour**

**Objectives:** It helps the students to learn the various tools and methods of economic analysis the nature and central problems of an economy

**Credits:** 5

PSO1. Introduction to micro economics

PSO2. Theory of consumer behaviour

PSO3. Theory of Demand and supply

PSO4. Theory of production

PSO5. Costs and revenues

### **BA 1st Year Sem -II**

#### **Economics paper-I micro economics**

#### **PSOs and COs pricing of products and factors**

**Objectives:** It deal with the market structure under that perfect and imperfect competition helps the students to understand the basic concepts and fundamental structure of the market with advance knowledge.

**Credits:** 5

PSO1. Market structure- Perfect competition and monopoly

PSO2. Monopolistic competition and oligopoly

PSO3. Theory of distribution

PSO4. Theories of wages and Rent

PSO5. Theories of interest and profit

### **BA II Year Sem –III**

#### **Economics paper-II**

##### **PSOs and COs of macro economics**

**Objectives:** Macro economics helps the students to apply the theory to the real events and issues and to make active use of the economic principles to the economy

**Credits:** 5

PSO1. Meaning and scope of macro of economics

PSO2. National income and social accounting

PSO3. Classical theory of employment and trade cycles

PSO4. Keynesian theory of employment & concepts of IS-LM curves

PSO5. Practical exercises in macro economic analysis

### **BA II Year Sem -IV**

#### **Economics paper-II**

##### **PSOs and COs of Monetary Economics**

**Objectives:** To make the student to learn the role of the monetary policies for the economic development and make them to understand the regulation of the money supply and the control of cost and availability of credit by central bank of the country through the use of deliberate and discretionary action for achieving objectives of general economic policy.

**Credits:** 5

PSO1. Money, Evolution, types, functions, Role, measures of money supply

PSO2. Quantity theories of money

PSO3. Inflation, Types, Causes, Effects, Measurement- Price index numbers

PSO4. Indian financial system- I, Banking

PSO5. Indian financial system- II, Money market and capital market

### **BA III Year Sem -V**

#### **Economics paper-III**

##### **PSOs and COs of theory of Development Economics (Discipline specific Core)**

**Objectives:** Critically analyzing the performance of Indian economy over the years discussing the problems confronting with the different sectors.

**Credits:** 5

PSO1. Economic growth and development

PSO2. Development issues- Population, Unemployment, Poverty, Income inequalities

PSO3. Theories of growth and development

PSO4. Development strategies

PSO5. Environment Sustainable development and inclusive growth

#### **Economics paper-IV**

##### **PSOs and COs of Public finance (discipline specific elective- I)**

**Objectives:** To make the students to know the nature role and importance of public finance in the context of economic welfare.

**Credits:** 5

PSO1. Introduction to public finance

PSO2. Public revenue

PSO3. Public expenditure

PSO4. Public Debt

PSO5. Indian fiscal policy

#### **Economics paper-IV**

##### **PSOs and COs of Demography (discipline specific elective- II)**

**Objectives:** To make to learn the various stages of demographic transition the number of people in a country at a particular time their growth rate, composition and distribution and their quality of life.

**Credits:** 5

PSO1.Theories of population

PSO2. Structure of population in India

PSO3. Fertility

PSO4. Mortality

PSO5. Migration and urbanization

#### **BA III Year Sem -VI**

#### **Economics paper-III**

##### **PSOs and COs of Indian and Telangana economic development (Discipline specific core)**

**Objectives:** Growth, development and Planning of various sectors like Agriculture, Industries in Indian Economy and Telangana State Economy

**Credits:** 5

PSO1. Economic planning and policy

PSO2. Issues in Indian Agricultural sector

PSO3. Indian industrial development

PSO4. Telangana Economy

PSO5. TSIPASS, Industrial policy, service sector, IT policy

#### **Economics paper-IV**

##### **PSOs and COs of International Economics (Discipline specific elective- I)**

**Objectives:** It deals with the theory and policy of international trade and its various problems and policies are discussed in a simple coherent comprehensive and critical manner.

It deals with classical and modern theories of international Trade, Tariffs import quotas, BOT, BOP, Trade Policy and role of International agencies in International Trade.

**Credits:** 5

PSO1.Theories of international trade

PSO2.Tariffs and balance of payments

PSO3. India's balance of payments

PSO4. Foreign trade policy

PSO5. FOREIGN and International finance.

#### **Economics paper-IV**

#### **PSOs and COs of Economics of Insurance (Discipline specific elective- II)**

**Objectives:** To make them to learn the mission of economic Insurance policies to explore and enhance the quality of life of people through financial security and the various insurance policies and their objectives.

**Credits:** 5

PSO1. Economic analysis of insurance

PSO2. Risk and risk Management

PSO3. Insurance and economic development

PSO4. Essentials of life and health insurance

PSO5. Essentials of general insurance

#### **B.A 1st Year Sub : Political Science Paper : I Political Theory , Semester – I**

#### **Objectives**

This is an introductory paper trying to expose students to some basic ideas and concepts in Political Science. An introduction to the basic concepts of political science such as history, Economics, Sociology, Liberal Approach, Marxist Approach, Behaviouralism and Post Behaviouralism, Divine Origin Theory, Evolutionary Theory, Social Contract Theory, Theories and kinds of Rights, Human Rights, State and Sovereignty, Nation and Civil Society, Monism, Pluralism. The student will develop an awareness and understanding of these concepts, institutions which will enhance their ability to interpret current political event.

**Credits:** 6 Theory periods of six hours per week over a semester

PSO 1 :Understand the Meaning, Definition, Scope, importance and evolution of political science

PSO 2 Explain the relationship of political science with other social sciences like History, Economics, Sociology

PSO 3 : Analyse various approaches to the study of political science like Liberal Approach, Marxist Approach, Behaviouralism and Post Behaviouralism

PSO 4 : Describe the different theories about the origin of state such as Divine Origin Theory, Evolutionary Theory, Social Contract Theory, Theories and kinds of Rights, Human Rights

PSO 5 :Explain State and Sovereignty, Nation and Civil Society, Monism, Pluralism

### **Programme Outcomes: For B.A First Year First Semester**

### **Course B.A I st Year Sub : Political Science Paper – 1I-State Concepts and Institutions, Semester – II**

#### **Objectives**

This is an introductory paper trying to expose students to some basic ideas and concepts in Political Science. An introduction to the basic concepts of political science such as individualism, Socialism, law Liberty, Equality: Kinds, Democracy, Unitary and Federal, Parliamentary and Presidential, Theory of Separation of Powers. The student will develop an awareness and understanding of these concepts, institutions which will enhance their ability to interpret current political events.

**Credits** : 6 Theory periods of six hours per week over a semester

PSO 1: Analyse different Ideologies Individualism, Socialism.

PSO 2: Explain Concepts and Institutions, law: Sources of Law, Rule of Law, Liberty: Kinds, Safe Guards of Liberty, Equality: Kinds, Relationship between Liberty and Equality.

PSO 3: Describe Forms of Government – Democracy: Direct and Indirect Unitary and Federal, Parliamentary and Presidential.

PSO 4: Analyse Organs of Government - Theory of Separation of Powers (Montesquieu).

PSO 5 : Understand the different organs of Government - Legislature: Unicameral and Bicameral -Powers and Functions, Executive: Powers and Functions, Judiciary:

Powers and Functions, Independence of Judiciary, Judicial Review.

## **Course B.A II Year, Political Science, Paper – III-Constitutional Government**

### **Semester –III**

#### **Objectives**

This paper introduces students to the Indian National Movement, Constitution of India in its structural and functional aspects, President, Fundamental Rights, Directive Principles of State Policy and Fundamental Duties etc. The student will develop awareness and understand Central and state Government which will enhance their ability to interpret current political events. This course is introduced to develop the knowledge of the student to write competitive examinations.

Organized in five units, the course deals with historical legacies and foundations of Indian state and democracy with reference to the making of the Indian Constitution. It will engage with the major aspects of the governments, namely the union and state It would also examine some of the new institutions that have emerged in India in recent decades. The student will understand the whole constitution and get waste knowledge in Indian government and politics

**Credits** : 6 Theory periods of six hours per week over a semester

PSO 1 : Explain about the Nationalist Movement and Constitutional Development, Impact of Colonial Rule and Indian National Movement, Indian Constitution: Evolution and Making of Indian Constitution, Philosophical Foundations and Salient Features of the Indian Constitution.

PSO 2: Analyse Fundamental Rights, Directive Principles of State Policy and Fundamental Duties, Relationship between Fundamental Rights and Directive Principles of State Policy.

PSO 3: Describe Union Government- President: Elections, Powers and Functions, Parliament: Composition, Powers and Functions, Prime Minister and Council of Minister-Powers and Functions, Supreme Court: Composition, Powers and Functions, Judicial Review, Judicial Activism.

PSO 4 : Understand the State Government- Governor- Powers and Functions, Chief Minister and Council of Ministers: Powers and Functions.

PSO 5: Explain State Legislature, High Court: Composition, Powers and Functions.

## **Course B.A II Year, Political Science, Paper – IV,-Indian Political Process, Semester- IV**

#### **Objectives**

Teaching politics in a country has to be grounded in understanding and analysis of politics of the country concerned. Thus, this paper seeks to introduce students the key institutions and processes of governance in India. It examines and locates changing patterns of Centre-state relations within the broad framework of transformation of India's polity from a centralized federation to a multilevel federal system. It will engage with the major aspects of the namely the National Human Rights Commission (NHRC): Emergence, Evolution and Functioning, National Commission for Women (NCW).The

Purpose of this course is to analyse the historical development of various forms of Dalit politics in India. This course is mainly concerned with three interrelated levels of analysis and discussion. The Dalit political ideology, programmes, forms of mobilization, organizational structures, electoral participations, voting pattern. Political parties are important and perform many valuable functions, including among others leadership recruitment and interest aggregation and it is through them very often that crucial political decisions are taken. The objective is to train the students to understand the whole concept of Indian political process.

**Credits** : 6 Theory periods of five hours per week over a semester

PSO 1: Describe the Political Process- Nature of Indian political Party System, National Political Parties – Indian National Congress, BJP, CPI,

CPIM, BSP. Regional Political

Parties: I – AIADMK, TDP and TRS.

PSO 2: Analyse the Union State Relations - Indian Federal System – Features, Centre - State Relations, Recent Trends in Centre State Relations.

PSO 3: Explain Social and Political Movements in India-Dalit Movements Environmental Movements, Women Movement.

PSO 4: Discuss Electoral Politics in India- Election Commission: Powers and Functions, Electoral Reforms, Voting Behaviour – Influences of Socio and Economic Factors.

PSO 5: Analyse about the Statutory Commissions for Protection of Rights - National Human Rights Commission (NHRC): Emergence, Evolution and Functioning, National Commission for Women (NCW).

### **Course B.A. III Year, Political Science, Paper – III, Indian Political Thought, Semester – V**

#### **Objectives**

This paper attempts to introduce students to the entire gamut of political thinking in India from the beginning to the present. It focuses on key thinkers from ancient to modern times to understand their seminal contribution to the evolution of political theorizing in India. It emphasizes on the distinctive contribution of Indian thinkers to political theorizing and the relative autonomy of Indian political thought. This course deals with the classical thinkers and themes of western political philosophy. An attempt to understand thinkers and texts both from philosophical and historical perspective. The main objective is to train students in the foundational texts and thinkers of political science. The purpose of this course is to introduce Indian political thought in order for the student to make sense of current trends in politics in an informed way. It looks at issues and conflicts within the political realm that have for ever been of interest in making sense of current politics, while noting the breaks and departures through which contemporary Indian politics is comprehended and negotiated.



**Credits** : 5 Theory periods of five hours per week over a semester

PSO 1: Analyze Ancient Indian Political Thought, Sources, Features, Manu: Varna dharma and Dandaneeti.

PSO 2 : Explain about Kautilya's views on Saptangas, Statecraft, Mandala Theory, Gautama .budha-his life and views on Sangha and Dhamma , eight fold path, socio, economic , Ideas and Political Ideas

PSO 3 : Discuss the Modern Indian Political Thought-Reformist Thought: Raja Ram Mohan y- His views on social reforms Brahma Samaj, Mahatma Jyothi Rao Phule – His life sketch and his views on Women education and Satya Shodak Samaj, caste system

PSO 4: Describe about Gandhi and his ideas on Ahimsa and Satyagraha, Trusteeship, Jawaharlal Nehru and his views on secularism, democratic socialism.

PSO 5 : Explain the B.R. Ambedkar's views on : Annihilation of caste, Jaya Prakash Narayan's Life and his ideas on Total Revolution

### **B.A III Year, Political Science, Paper – III, Western Political Thought, Semester – VI**

#### **Objective**

This paper studies the classical tradition in political theory from Plato to Marx with the view to understand how the great Masters explained and analyzed political events and problems of their time and prescribed solutions. The legacy of the thinkers is explained with the view to establishing the continuity and change within the Western political tradition.

**Credits** : 5 Theory period of five hours per week over a semester

PSO 1: Explain about the Western Political Thinkers. Plato's ideas on best ideal state, Second ideal state, Aristotle's life and his views on citizenship, family, education, slavery, revolutions, and origin of state.

PSO 2 : Discuss the St. Thomas Aquinas ideas on classification of law, state and church Machiavelli's life and his views on ethics and religion, suggestions to the king for the Retention of power

PSO3: Analyse the Thomas Hobbes ideas on social contract theory, John Locks life and his ideas on Natural Rights and social contract theory, Jean Jacque Rousseau life and his ideas on Natural Rights and social contract theory,.

PSO4: Describe the life views of Jeremy Bentham on Prison reforms and utilitarianism, John Stuart Mill life sketch and his views on liberty, adult franchise, women Education, representative government

PSO5: Understand the life sketch of Karl Marx views on theory of historical materialism, theory of surplus value, dictatorship of proletariat, Hegel life his views on dialectical materialism, and state

### **B.A III Year, Political Science, Paper- IV, International Relations, Semester-V**

## **Objective**

This paper deals with concepts and dimensions of international relations and makes an analysis of different theories highlighting the major debates and differences within the various theoretical paradigms. The dominant theories of power and different aspects of balance of power are included. International conflict, particularly war, continues to be an important focus of the field. Why do wars start? Who wins and why? How can wars be prevented? The student is expected to study International Politics and India's Foreign Policy from a pro-active and futuristic perspective. The emergence of a nation-state system, which gave birth to the 'inter-national' and its attendant institutions and practices (marked symbolically by the Treaty of Westphalia), was integrally linked to the violence of European expansionism. And yet these signs have been consistently erased historically both in the practices of IR and in the discipline, which has been a reflection of the former. This has allowed the dominant discourses of IR to speak in terms of the 'universal' or 'global' while the non-west can express itself only in terms of the 'local' or 'provincial'. The main objective of this course is to genealogically trace the links between IR and colonialism.

**Credits** : 5 Theory periods of five hours per week over a semester

PSO 1 : Describe about International Relations: Introduction, Evolution, Nature, Scope and Significance, History of International Relations: Rise of sovereign state system, First World War causes and consequences, Second World War causes and consequences

PSO 2: Analyze Super Powers and causes for the rise of super powers Cold War origin, cause, evolution, Power: Elements of National power.

PSO 3 : Explain the Colonialism and causes of colonialism, causes for Decolonization and its impact on international relations

PSO 4 Understand Developing Nations and Problems, World Bank and powers and functions, World Trade Organization Functions and role.

PSO 5: Discuss the Globalization and its impact on Developing Nations.

## **B.A III Year, Political Science, Paper – IV-International Relations, Semester –VI**

### **Objectives**

The field of international relations is concerned with developing an understanding of why states and non-state international actors, like the United Nations and multinational corporations, interact as they do. International relations is a diverse field both in terms of what kinds of behaviour are studied and how they are studied? What is the role of international law and organizations? As the world has become more interdependent, scholars have become more aware of the importance of international economic activity. As a result, scholars are analyzing world trade, communications, development, foreign investment, and international finance. How states make foreign policy decisions is another important area of study. National security policy, nuclear deterrence, arms control and defence spending decisions are typical examples of foreign policy decisions. The student will get lot of knowledge in international relations.

Credits: 5 Theory periods of five hours per week over a semester

PSO 1. Analyse League of Nations origin, structure and causes for its failure, United Nations

Organization: Structure and role, Need for revision of the charter.

PSO 2. Discuss European Union powers functions and its role, South Asian Association for

Regional Cooperation (SAARC) powers and its role, Association of South East Asian

Nations (ASEAN) powers and its role

PSO 3 Describe about the Arms Race, Arms Control, Disarmament, Issues in Nuclear Politics.

PSO 4 Explain the India's Foreign Policy- Determinants and Features, Issues, Recent Trends, Non-Alignment-characters Evaluation and Relevance, Recent Trends.

PSO 5 Understand the Contemporary Issues in International Relations: Gender Justice.

## **SUBJECT: PUBLIC ADMINISTRATION**

### **Objective**

The board objectives of the Undergraduate Programme in Public Administration include:

- Understand public administration theory and concepts from multiple perspectives;
- Acquaint with the functioning of the Indian administration, at central, state and local levels and the responses of these systems in addressing the concerns of the people;
- Acquaint with India's development experience and changing role of administration;
- Understand the interface of theory and practice in Public Administration;
- Develop conceptual, analytical and problem solving abilities among the learners;
- Acquaint the learner with the required knowledge of administrative science and government in action and the contemporary issues in public affairs management and,
- Understand the world of public administration from the public perspective and provide foundation for further studies in Public Administration
- Understand the role of Public Services in the new State of Telangana.

### **The Objectives of the Course are:**

1. To understand the form and substance of Indian Administration; and
2. To appreciate the emerging issues in Indian Administration in the context of changing role of state, market and civil society.

### **Course Objective**

The Constitution of India defines the basic objectives and functioning of the government. It has provisions for bringing about social change and defining the relationship between individual citizen and the state. It lays out certain ideals that form the basis of the kind of country that we as a citizen

aspire to live in. An in-depth analysis of various basic areas of constitution is the main objective of this inter disciplinary course. This helps the students to strengthen their understanding of Indian constitution and functioning of government.

**Subject code: Pub 151**

**Expected Outcomes**

After study of the Course-1, the learner should be able to:

- Appreciate the nature, scope and changing paradigms of Public Administration;
- Understand the synthesizing nature of knowledge of public administration from public perspective;
- Grasp the administrative theories, concepts and principles to make sense of administrative practices.

**Subject Code: BA 407**

**Expected Outcomes**

After study of the course, the learner should be able to:

- discern the connects and disconnects between structure, purpose and process and results in Indian Administration;
- Understand the Indian Administration role as the main instrument of State to achieve its developmental goals;
- Appreciate the varying historical, socio-economic, political and other conditioning factors that gave Indian Administration its distinct nature to the learner
- **Subject Code: BA 351**

**Expected Outcomes**

After study of the course, the learner should be able to:

- Understand the way in which the public power is exercised and public resources are managed and expanded;
  - Unravel the varying methods of performance assessment of public institutions; and
- Appreciate the changing paradigms of human resource management.

**Subject Code: BA 351/A**

**Expected Outcomes**

After study of the course, the learner should be able to:

- Critically appreciate the relationship of local governance and development;
- Appreciate the rural and urban institutional arrangements for development;
- Understand the processes and results of systems of delivery of welfare programmes

## **Computer sciences**

### **PROGRAM OUTCOMES**

**Computer Science graduates within 3 years of graduation will impact the local, national, and global communities by:**

1. Effectively communicating computing concepts and solutions to bridge the gap between computing industry experts and business leaders to create and initiate innovation
2. Effectively utilizing their knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.
3. Exhibiting their computing expertise within the computing community through corporate leadership, entrepreneurship, and/or advanced graduate study
4. Developing and implementing solution based systems and/or processes that address issues and/or improve existing systems within in a computing based industry.

#### **Outcome 1 - Communication**

Students will be able to communicate in written and oral forms in such a way as to demonstrate their ability to present information clearly, logically, and critically.

#### **Outcome 2 - Mathematics and Theory**

Students will be able to apply mathematical and computing theoretical concepts in solution of common computing applications, such as computing the order of an algorithm.

#### **Outcome 3 - Programming**

Students will be able to complete successfully be able to program small-to-mid-size programs on their own. Sufficient programming skills will require use of good practice, e.g., good variable names, good use of computational units, appropriate commenting strategies.

#### **Outcome 4 - Systems Design and Engineering**

Students will be able to use appropriately system design notations and apply system design engineering process in order to design, plan, and implement software systems

#### **Outcome 5 - Depth of Knowledge**

In a self-selected area of depth in Computing, students will demonstrate a depth of knowledge appropriate to graduate study and/or lifelong learning in that area. Students should be able to read for understanding materials in that area beyond those assigned in coursework.

#### **Outcome 6 - Preparation for Career and/or Graduate Study**

Students will be prepared for a career in an information technology oriented business or industry, or for graduate study in computer science or other scientific or technical fields.

#### **Program Specific Objectives**

- ✓ Bachelor of Science in Computer Science is to prepare students for successful careers and for advanced graduate study in computer science.
- ✓ To impart knowledge of a broad range of Computer Science skills, tools, and mathematical techniques, and the capability of applying them to analyze and design complex systems.
- ✓ To make them understand fundamental theoretical and practical concepts in Computer Science.
- ✓ Build the ability to adapt to an ever-changing technological landscape.
- ✓ Impart capability of solving a wide variety of problems by applying principles of computational thinking.
- ✓ Inculcate habits of working effectively and professionally on diverse project teams.
- ✓ Induce the ability to communicate technical information clearly and effectively, both orally and in writing.

- ✓ Facilitate them to understand how to approach social effects of computing ethically and responsibly, and being committed to doing so.
- ✓ Imbibe interest in life-long learning, to adapt and shape an evolving world.
- ✓ Instil the ability to participate in interdisciplinary collaborations and apply computational methods in new and unfamiliar domains.

### **Semester I Title : Programming in C**

#### **Objectives:**

- To learn the basics of C declarations, operators and expressions.
- To work on all the elementary statements (Loop, Branch) and arrays, functions
- This reference has been prepared for the beginners to help them understand the basic t advanced concepts related to C Programming languages.
- To work on structures, File input output streams, typecasting.
- To learn on the manipulation of strings.
- To learn how to use pointers, structures and unions.
- To learn how to create data files, processing of files.
- To understand and develop well-structured programs in C language.

#### **Learning Outcomes:**

- Understanding a functional hierarchical code organization.
- Ability to define and manage data structures based on problem subject domain.
- Ability to work with textual information, characters and strings.
- Ability to work with arrays of complex objects.
- Understanding a concept of object thinking within the framework of functional model.
- Understanding a concept of functional hierarchical code organization.
- Understanding a defensive programming concept.
- Ability to handle possible errors during program execution

### **Semester II Title : Programming in C++**

#### **Objectives:**

- Understand object oriented programming and advanced C++ concepts
- Be able to explain the difference between object oriented programming and procedural programming.
- Be able to program using more advanced C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, file I/O, exception handling, etc.
- Be able to build C++ classes using appropriate encapsulation and design principles.
- Improve your problem solving skills
- Be able to apply object oriented or non-object oriented techniques to solve bigger computing problems

#### **Learning Outcomes :**

- Identify classes, objects, members of a class and relationships among them needed for a specific problem Identify
- Write c++ application programs using OOP principles and proper program structuring
- Write programs using the concepts of polymorphism and inheritance
- Write c++ programs to implement error handling techniques using exception handling

### **Semester III Title :Data Structure**

## COURSE OBJECTIVES

- To impart the basic concepts of data structures and algorithms
- To understand concepts about searching and sorting techniques
- To Understand basic concepts about stacks, queues ,lists, trees and graphs
- To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures

## COURSE OUTCOMES:

- Ability to analyze algorithms and algorithm correctness.
- Ability to summarize searching and sorting techniques
- Ability to describe stack, queue and linked list operation.
- Ability to have knowledge of tree and graphs concepts

## Semester IV Title :Data base management System

## COURSE OBJECTIVES

- Understand the role of a database management system in unorganisation
- Understand basic database concepts, including the structure and operation of the relational data model.
- Construct simple and moderately advanced database queries using Structured Query Language
- Understand and successfully apply logical database design principles, including E-R diagrams and database normalization.
- Understand the concept of a database transaction and related database facilities, including concurrency control backup and recovery, and data object locking and protocols.
- Understand the role of the database administrator.

## Course Out Comes

- To give an introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design
- To present SQL and procedural interfaces to SQL comprehensively
- To present the concepts and techniques relating to query processing by SQL engines.
- Understanding PL/SQL block, control statement, cursors, exception handling in PL/SQL

## ZOOLOGY

## B.Sc. I Year, Semester- I

### Syllabus Animal Diversity – Invertebrates

### Discipline Specific Course, Paper – 2017-18

**Number of credit: 4**

### Objectives

- The course will cover Invertebrates, which is the science that studies the animals without backbone.
- Introduce students to the difference between invertebrates and vertebrates.
- Study the link between vertebrates and invertebrates
- Study the important features of the animal type study: Digestive system, Respiratory system,

Circulatory system, Nervous system, Reproductive system and Life cycles.

**Outcomes-**

- This syllabus enables students to have grip in Basic Sciences helps in understanding Invertebrates in detail.
- Helps in acquiring Practical knowledge through specimens and slides

**B.Sc. I Year SEMESTER- II**

**Discipline Specific Course, Paper – II**

**Perspectives in Ecology and Animal Behavior-2017-18**

**Number of credits: 4**

**Objectives-**

- To have a good understanding of ecology and Zoogeographical regions and their important fauna
- To know the basic principles of wildlife, wild life resources & management.
- To be able to analyse wildlife problem by studying various Wild life projects

**Outcomes–**

- There will be increase demand for Zoologists and Wild life biologists in future with need to study the effects of human growth and development on wild life and natural environment
- Foundation to work in farming, wildlife, veterinary or pet care industries.
- Animal behavioural adaptations & learning process

**B.Sc. II Year – SEMESTER III**

**Discipline Specific Course, Paper – III**

**Animal Diversity- Vertebrates and Developmental Biology- 2018-19**

**Number of credits: 4**

**Objectives:-**

- The student will learn to observe the characteristics of vertebrates
- The student will practice sorting and analytical skills.
- The course gives the basis understanding of Vertebrate development.
- The goal is to provide students with an understanding of the principles of embryology.

**Outcomes–**

- Learn to identify Animals is the basic foundation for the Research.
- Describes how scientific methods are used to explain Natural phenomena.

**B.Sc. II Year SEMESTER -IV**

**Discipline Specific Course, Paper – IV**

**Cell Biology, Genetics & Evolution -2018-19**



**Number of credits: 4**

**Objectives**

- Students will understand how these cellular components are used to generate and utilize energy in cells
- Students will understand the cellular components underlying cell division.
- Students will apply their knowledge of cell biology to selected examples of changes or losses in cell function. These can include responses to environmental or physiological changes, or alterations of cell function brought about by mutation
- Give the composition of proteins and nucleic acids.
- to understand the gene pools-Hardy-Weinberg's law, Isolation ,speciation & Natural selection

**Outcomes**

- Awareness on the advances in evolution of animals.
- Understanding safe Laboratory practices and perform basic molecular biology and Genetic practical's

**B.Sc. III Year SEMESTER- V**

**Discipline Specific Course, Paper – V**

**Physiology: Life Sustaining Systems-2019-20**

**Number of credits: 3**

**The Objectives:-**

- To provide you with an understanding of the fundamental principles of animal physiology;
- The syllabus will address topics in physiology of digestion, nerve function, muscle function
- Osmo regulation and excretion, respiration & circulation
  
- To provide experience in researching, discussing, and answering questions about animal physiology
  
- Describe the important structural features of bio molecules carbohydrates, proteins and lipids on the basis of their structure & function.

**Outcomes–**

- An integrated understanding of Physiological mechanisms.
- An interdisciplinary understanding of Zoology with chemistry.
- Understanding better laboratory practices and performing Biochemical Estimations.

**B.Sc. III Year VI– SEMESTER**

**Discipline Specific Course, Paper – VII**

## **Immunology and Animal Biotechnology-2019-20**

**Number of credits: 3**

### **Objectives-**

- Development of a personal strategy to regularly maintain and update medical knowledge
- To learn about the structural features of the components of the immune system as well as their functions, mechanisms involved in immune system development and responsiveness.
- To develop understanding of plasmids, vectors, recombinant technology, cloning, Transgenesis and stem cell technology.

### **Outcomes-**

- Apply scientific principles in the integration of immunological response and data.
- Understanding the roles of Immunology in protection against diseases & autoimmune disorders in their daily lives.

### **B.Sc. (Biotech)**

**Sem I: CELL BIOLOGY & GENETICS**

**Subject code: Bio101**

### **Course Objectives**

- To provide an introduction to Cell Biology and Genetics from general principles to modern day applications.
- To describe the most important functions of the cell, its microscopic structure and the structure and function of the different cell organelles
- To describe basic mechanisms for cell growth, cell death, cell specialisation, cell motility and interactions between cells and explain how these together facilitate the development of a multicellular organism.
- To explain different hereditary patterns for genetic diseases and be able to describe different ways at a general level to identify disease genes.

### **Course Out comes**

- Students can able to describe the features of prokaryote and Eukaryote cells, the composition and spatial organisation of the cell.
- Comprehend and describe chromatin structure, gene regulation, and the ways in which molecular biology throws light on gene function and the genetic regulation of cell specialisation
- Ability to understand the Cancer, tumorigenesis and the cell cycle.
- The transmission of genetic material in cell division by mitosis or meiosis, the control of these processes and how cell division fits within the cell cycle. Human Spermatogenesis and Oogenesis in relation to cell division
- The phenomenon and implications of Chromosome karyogamy, variation in chromosome number (polyploidy and aneuploidy).
- The analysis of genetic variation in inheritance and transmission genetics including epistasis .
  
- Sex determination, sex linkage, and human pedigree analysis.

**Sem II: NUCLEIC ACIDS & BIOINFORMATICS**

**Subject code: Bio151****Course Objectives**

- This course will provide an overview of nucleic acid structure and function. In addition, students will learn current techniques for isolating and working with both RNA and DNA.
- The proteins involved in carrying out both the synthesis and degradation of nucleic acids will be discussed in detail.
- The basic biological reactions involving DNA, i.e., replication, recombination and repair, will also be taught.
- The basic objective is to give students an introduction to the basic introduction of bioinformatics.
- Emphasis will be given to the application of bioinformatics and biological databases to problem solving in real research problems.
- To become familiar with the use of a wide variety of internet applications, biological database and will be able to apply these methods to research problems.

**Course Out comes**

- Understands the experiments that demonstrated that DNA is the genetic material.
- Explain how the contributions of Wilkins and Franklin, Watson and Crick, and Chargaff resulted in understanding the structure of DNA.
- Explain the results of the Meselson-Stahl experiment and describe the predicted results if DNA replication followed the other possible models.
- Outline the basic steps involved in DNA replication, including major differences between eukaryotes and bacteria.
- Explain how eukaryotes overcome the difficulty of replicating the ends of linear chromosomes
- The students will be able to describe the contents and properties of the most important bioinformatics databases, perform text- and sequence-based searches, and analyze and discuss the results in light of molecular biological knowledge
- The students will be able to explain the major steps in pairwise and multiple sequence alignment, explain the principle for, and execute pairwise sequence alignment by dynamic programming.
- The students will be able to predict the secondary and tertiary structures of protein sequences.

**Sem III: BIOCHEMISTRY AND BIOSTATISTICS****Subject code: Bio201****Course Objectives**

- The course aims to provide an advanced understanding of the core principles and topics of Biochemistry and Biostatistics
- To understand the molecular architecture of eukaryotic cells and organelles, including membrane structure and dynamics;
- The principles of bioenergetics and enzyme catalysis; the chemical nature of biological macromolecules, their three-dimensional construction, and the principles of molecular recognition
- To understand the dietary requirements of man and selected domestic animals;
- The metabolism of dietary and endogenous carbohydrate, lipid, and protein;
- To describe major pathways like Glycolysis, TCA cycle, Urea cycle etc.
  
- To understand basic terms and applications of biostatistics.
- To demonstrate an understanding of the central concepts of modern statistical theory and their probabilistic foundation.

- Measure central tendencies like mean, mode and median and their relationship.
- To understand the concept of genomics, proteomics and use FASTA and BLAST.
- To represent the DATA diagrammatically.

### **Course Out comes**

By the end of the course, students should be able to:

- Demonstrate knowledge and understanding of the molecular machinery of living cells;
- Demonstrate knowledge and understanding of the principles that govern the structures of macromolecules and their participation in molecular recognition;
- Demonstrate knowledge and understanding of the principles and basic mechanisms of metabolic control and molecular signalling.
- Ability to Calculate bioenergetics of carbohydrates, fatty acids etc.
- Understand biosynthesis and elongation of fatty acids.
- Select and use and interpret results of, descriptive statistical methods effectively.
- Select and use, and interpret results of, the principal methods of statistical inference and design & communicate the results of statistical analyses accurately and effectively.
- Make appropriate use of statistical software.
- Read and learn new statistical procedures independently and effectively.

## **SEM IV: MICROBIOLOGY & IMMUNOLOGY**

**Subject code: Bio251**

### **Course Objectives**

- To introduce the new subject Microbiology to the students, this course includes scientist's contributions towards the subject with the scope and importance.
- To develop the skills of working independently with the Microscope, course includes Microscopy.
- Explain principles of physical and chemical methods used in the Sterilization to control the microorganisms.
- This course also includes the techniques used in isolation and identification of pure cultures.
- The study of immunology will enable the student to gain a broad foundation base and build upon that base for understanding the defence mechanisms of the human body.
- Conceptualize how the innate and adaptive immune responses coordinate to fight invading pathogens features of the components of the immune system as well as their functions.
- It helps the students to understand the immunomodulatory strategies can be used to enhance immune responses or to suppress unwanted immune responses such as might be required in hypersensitivity reactions, transplantations or autoimmune diseases.
- Demonstrate a comprehensive and practical understanding of basic immunological principles involved in research and clinical/applied Science.

## Course Out comes

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

- Describe in details the morphology, the culture, spread, biochemical activities, antigenic characters, pathogenesis, laboratory diagnosis, treatment & prevention & control measures of each bacteria.
- This syllabus enables students in understanding the importance of Microbiology in detail.
- Helps in acquiring Practical knowledge through Microscopy, Sterilization and Isolation techniques.
- Have a knowledge of key concepts regarding immunity and the immune response
- Students Understand how immunologists think and work
- Differentiate between innate and adaptive immunity.
- Explain the mechanisms and differences between primary and secondary responses and their relevance to immunizations.
- Identify the role of antigen presenting cells, lymphocytes, and phagocytic cells in immune responses.
- Differentiate between humoral and cell mediated immunity
- Can able to discuss current immunology news and issues.
- Apply scientific knowledge in diagnosing diseases.
- Understanding the roles of Immunology in protection against diseases & autoimmune disorders in their daily lives.

## SEMESTER -V: PAPER III- MOLECULAR BIOLOGY

### Subject code: Bio301

#### Course Objectives

- The objective of this course is to explain and give examples of how ionic, hydrophobic, and hydrogen bonding interactions determine the structure of nucleic acids and proteins and modulate the specificity of binding between them.
- To distinguish between different molecular biology techniques that are used to isolate, separate, and probe for specific proteins, nucleic acids, and their interactions.
- To compare and contrast the mechanisms of bacterial and eukaryotic DNA replication, DNA repair, transcription, and translation.
- To explain how DNA topology and chromatin structure affects the processes of DNA replication, repair, and transcription; to give examples of DNA and histone modifications and predict how they will affect gene expression.
- To describe mechanisms by which DNA can be damaged and describe the molecular mechanisms by which protein complexes repair different forms of DNA damage.
- To describe how pre-mRNA splicing occurs and explain how alternative splicing generates protein diversity.
- To explain the molecular mechanisms behind different modes of gene regulation in bacteria and eukaryotes at both pre- and posttranscriptional levels.

## Course Out comes

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

- Understand and apply the principles and techniques of molecular biology which prepares students for further education and/or employment in teaching, basic research, or the health professions.
- Demonstrate the knowledge of common and advanced laboratory practices in cell and molecular biology

- Students will gain an understanding of chemical and molecular processes that occur in and between cells and will be able to describe and explain processes and their meaning for the characteristics of living organisms.
- Students will gain insight into the most significant molecular and cell-based methods used today to expand our understanding of biology.
- Demonstrate knowledge of how biochemistry, genetics and molecular biology are used to elucidate both the function of cells and their organization into tissues.
- To understand the structure and machinery of nuclear functions responsible for cell functioning

#### **SEMESTER -V: PAPER IV- APPLICATIONS OF BIOTECHNOLOGY**

##### **Course Objectives**

- To provide a basic understanding of animal biotechnology, plant Biotechnology and its applications.
- To inculcate the understanding of plant and animal cell culture techniques, significance of its cultivation and its application in the production of valuable products.
- To develop an understanding on basic pattern of animal breeding, controlling characters and disorder.
- To impart knowledge on production of transgenic animals and Molecular pharming.
- To describe mechanisms of recombinant DNA technology in agriculture and production of commercially useful products using plant cell cultures.

##### **Course Out comes**

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

- To understand the basic concepts and state of art techniques and methods underlying plant and Animal biotechnology research including the molecular basis of plant and animal breeding.
- The students will gain and understand theoretical principles enabling them to employ the knowledge to solve problems related to plant production and protection through biotechnological approaches.
- Demonstrate the knowledge of plant tissue culture and genetic manipulation of plants.
- To employ advanced technologies in animal biotechnology such as genetic modification and molecular genetics.
- To understand the structure and machinery of In vitro fertilization and embryo transfer.
- To explore the advanced technologies of Gene therapy.
- To give a practical hand-on experience related to advanced techniques and equipment used in plant and animal biotechnology.
- To enable the students to understand and discuss the potential applications biotechnology and understand the significance of cultivation of the cells in vitro.

#### **SEMESTER -VI: PAPER III- GENETIC ENGINEERING AND IMMUNOLOGY**

##### **Course Objectives**

- Aimed at introducing the science of immunology and a detailed study of various types of immune systems and their classification, structure, and mechanism of immune activation.
- To familiarize students with the immune system ,their structure and classification, genetic control of antibody production, cellular immunology, mechanism of activation in hypersensitive immune reaction .
- The role of the immune molecules in infectious diseases, autoimmunity, and cancer will be discussed.
- To provide the basic knowledge about genetic engineering for cloning and expression of proteins.

- To familiarize the students with the basic concepts and principles of Utilization of different expression vectors for cloning in prokaryotic and eukaryotic organisms.
- To better understand the different strategies of gene cloning and construction of genomic and DNA libraries for applications of recombinant DNA technology
- To provide the detail knowledge about Blotting techniques, PCR Technology and DNA Finger printing.

#### **Course Out comes**

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

- To learn outcomes and gain Knowledge about the different uses of genetic engineering techniques in biotechnology. These include the tools used, diagnostic system used in molecular biology.
- After the course the students are expected to understand new development in the field with analytical thinking of the various aspects of the new technology.
- Students will gain insight into the most significant molecular and cell-based immune systems.
- The students will have sufficient scientific understanding of different types of Immune responses and organ transplantation.  
The students will gain and understand the basic concepts of autoimmune diseases and their treatment procedures.

#### **SEMESTER -VI:**

#### **PAPER IV-APPLICATIONS OF BIOTECHNOLOGY**

#### **Course Objectives**

- The objective of the course is to familiarize the students with basic concepts in Industrial Biotechnology.
- This course provides an opportunity to learn the importance of the industrial fermentation processes and production of various valuable bio products through fermentation.
- To familiarize students with different fermentation techniques at industrial level.
- The course is designed to outline the methodology for research in biotechnology and provides an understanding of the ethical issues underlying biotechnology research and innovation in addition to protection of the acquired intellectual property.
- The purpose of this course is to provide an understanding of fundamental concepts and underlying principles in the Environmental sciences. In addition, the course covers the application of biology-based technologies for bio energy and bio-remediation.
- To focus the involvement of microbes in waste water treatments.
- Detail study of Bio pesticides and Bio fertilizers.

#### **Course Out comes**

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

- Gain knowledge and understanding of definition and the different uses of industrial biotechnology.
- At the end of the course, the students will have sufficient scientific understanding of different types of biotechnological methods to improve the value of different commercial and new techniques used in Industrial Biotechnology.
- Understand the basics of industrial fermentation process and gain the knowledge about the products of primary and secondary microbial metabolites.
- To learn about the production process of beverages and pharmaceutically important bio products.
- The student will gain an understanding research methodology, the ethical issues underlying biotechnology research and the importance of

protection of intellectual property.

- To impart knowledge on the importance of intellectual property and its protection under the constitution.
- The course provides a comprehensive knowledge in environmental science, environmental issues and the management.
- The students will have sufficient scientific understanding of different types of biotechnological methods to improve environment value and new techniques used in Environmental Biotechnology.
- To understand the treatment of wastewater and solid waste management.

### **B.Sc. (BZC)**

#### **Program Objectives (PO's)**

The Biological Sciences undergraduate degree program aims to diversely train the students, enabling graduates to pursue careers or advanced degrees in life and health sciences, research, education, industry, or governmental work.

To master a broad set of biological and chemical knowledge concerning the fundamentals in these areas.

To Develop a plan for professional growth and development.

#### **Programme Out comes: (PO's)**

- Ability to build a strong foundation of knowledge in different disciplines of their study.
- Successfully perceive their career objectives in advanced education in professional in a scientific career in a government or industry, in a related career following graduation.
- Ability to collaborate with others from different disciplines in the recognition that multidisciplinary approaches are necessary to address the major issues facing society.
- To develop an attitude fir working effectively and efficiently in any competitive environment.
- Professional growth and development in independent learning and creativity.
- Ability to Inculcate the Time Management, Work discipline, Skill in the students to strengthen their minds.
- Participation in various activities to strengthen in Academic and also in other programmes

#### **Program Specific Outcome : (PSO's)**

- Apply the broad knowledge of science across a range of fields, with in-depth knowledge in at least one area of study, while demonstrating an understanding of the local and global contexts in which science is practiced;
- To apply the appropriate methods of research, investigation and design, to solve problems in science, Botany, Zoology, Chemistry.
- To articulate the relationship between different science communities of practice, the international scope of science, and the contributions to their development that have been made by people with diverse perspectives, cultures and backgrounds
- To evaluate the role of science, in current issues facing local and global communities.
- B.Sc graduates can opt to join a postgraduate level degree programme in their respective field or subject to pursue further studies.
- After completing B.Sc. degree one can get employed different sectors in addition to scientific sectors, and seek out for career in research laboratories, Government corporations, banking and finance etc.
- Life Science Graduates can also find jobs in IT industry, Business, BPO, Marketing, Technical writing and so on.



## **BOTANY**

### **Microbial Diversity of Lower Plants:**

**CO1:** To identify the differences between Algae bacteria, Bacteria and Cyan bacteria.

**CO2:** Lichens study and economic important in ecological Aspects.

**CO3:** Virus and Bacteria study and their diseases.

**CO4 :** Acquiring relevant knowledge about algae and fungi

And economic importance.

**CO5:** Mushrooms cultivation and economic importance.

**CO6:** To understand and gain the theory and practical Knowledge.

**Credits:** 4 Theory period of 1 hour per week over a semester – 4 Credits.1 Practical period of 2 hour per week over a semester – 1 Credit.

### **Bryophyta, Pteridophyta, Gymnosperms and ale botany**

**CO1:** Life history and systematic position of Bryophyta, Pteridophyta, and Gymnosperms.

**CO2:** Bryophytes, Pteridophytes and Gymnosperms Morphology, Reproduction and life cycle.

**CO3:** Evolution of Saprophyte and stellar evolution.

**CO4:** Student will be acquiring relevant knowledge about gymnosperms its Classification, morphology, Reproduction, lifecycle.

**CO5:** Student will get knowledge about Economic importance of gymnosperms.

**CO6:** Fossils, Fossilization, importance of fossils and Geological time scale.

**CO7 :** To understand and gain the theory and practical

Knowledge.

**Credits:** 4 Theory period of 1 hour per week over a semester – 4 Credits.1 Practical period of 2 hour per week over a semester – 1 Credit.

### **Taxonomy of Angiosperms & Medicinal Botany**

**CO1:** Types of classification and Nomenclature of Angiosperms.

**CO2 :** To study the different families and their Economic Importance, with collection Of Herbarium

**CO3:** Knowledge about the Medicinal Plants.

**CO4:** Traditional and Modern Medicine, Pharmacognosy and Crude Drugs.

CO5: To understand and gain the theory and practical knowledge.

**Credits:** 4 Theory period of 1 hour per week over a semester – 4 Credits. 1 Practical period of 2 hour per week over a semester – 1 Credit.

### **Anatomy & Embryology**

CO1 : Understand the meristems with respect to their position function

And structure.

CO2 : Enumerate the products of vascular cambium with relevance of secondary

Cambium in wood formation.

CO3 : Study of male gametophyte and female gametophyte and different types of Embryo development

CO4: Study the fertilization process and Palynology.

CO5: To understand and gain the theory and practical knowledge.

**Credits:** 4 Theory period of 1 hour per week over a semester – 4 Credits. 1 Practical period of 2 hour per week over a semester – 1 Credit.

### **Ecology and Biodiversity**

CO1 : To understand the Ecological relationships, between different organisms and their environment

CO2: Understanding structure and function of different ecosystems.

CO3: The Inter relationship between organisms in population and communities.

CO4: Concepts, conservation levels, threats and value of Bio-diversity.

CO5: Agro Biodiversity, Hotspots, and role of organization in the conservation of biodiversity.

CO6: To understand and gain the theory and practical knowledge.

**Credits:** 3 Theory period of 1 hour per week over a semester – 3 Credits. 2 Practical period of 3 hour per week over a semester – 1 Credit.

### **Physiology**

CO1 : To understand the physiological and fundamental processes metabolism of plants.

CO2: Nomenclature, Classification and mechanism of an enzyme.

CO3: Role of photosynthesis, Respiration, Nitrogen metabolism.

CO4: Physiological effects of Growth hormones and stress physiology.

CO5: To understand and gain the theory and practical knowledge.

**Credits :** 3Theory period of 1 hour per week over a semester – 3 Credits. 2 Practical period of 3 hour per week over a semester – 1 Credit.

### **Cell Biology and Genetics**

CO1: Cell structure and molecular organization, cell organelles and cell cycle.

CO2: Chromosome structure and special types of chromosome.

CO3: To understand the laws of inheritance.

CO4: Gene mutations, expression of gene.

CO5: To understand and gain the theory and practical knowledge.

**Credits:** 3Theory period of 1 hour per week over a semester – 3 Credits. 2 Practical period of 3 hour per week over a semester – 1 Credit.

### **Tissue Culture, Biotechnology, Seed Technology and Horticulture**

**CO1:** Tissue culture techniques, secondary metabolites.

**CO2:** Biotechnology applications and Transgenic plants.

**CO3:** Seed dormancy, storage, viability and seed production technology.

**CO4:** Horticulture, Floriculture, Bonsai and vegetative prorogation of plants.

**CO5:** To understand and gain the theory and practical knowledge.

**Credits:** 3Theory period of 1 hour per week over a semester – 3 Credits. 2 Practical period of 3 hour per week over a semester – 1 Credit.

## **B.Sc CHEMISTRY**

### **Course Objectives:**

- The undergraduate program in chemistry to provide education in the fundamental areas of chemical knowledge and experimentation .which requires for careers in many different areas of chemistry.
- The chemistry provides an education based on science both for students planning to go on to graduate study, and for those intending to immediately pursue professional careers in chemistry or an allied field in which sound knowledge of chemistry is important.
- The student will learn professionalism, including the ability to work in teams and apply basic ethical principles.

### **Programme Specific Outcomes**

- Have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical Chemistries.
- Able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.
- Students will be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.
- Will appreciate the central role of chemistry in our society and use this as a basis for ethical behavior in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.
- To explain why chemistry is an integral activity for addressing social, economic, and environmental problems.

### **B.SC CHEMISTRY COURSE OUTCOMES**

#### **Paper-I (Inorganic, Organic, Physical & General Chemistry)**

Course Outcomes:-

- CO.1 Understands the general trends in the chemistry behind S and P block elements.
- CO.2 Able to know the fundamental principles of organic chemistry that include nomenclature, chemical bonding, structure & isomerism.
- CO.3 Explain difference between saturated, unsaturated hydrocarbons & cyclo alkanes.
- CO.4 Able to discuss about working principle behind LCD devices.
- CO.5 Demonstrates proficiency in understanding the basic structure of atom and interpret the electron behaviour using quantum chemistry principles.
- CO.6 Able to draw the MOED of homo and hetero molecules
- CO.7 Explain the classification of errors, Accuracy and precision.

#### **QUALITATIVE ANALYSIS**

- CO.1 The students acquire practical skills by applying solubility product in qualitative detection of cations in a given salt mixture

**Four theory period of 1 hr per week over a semester- 4 credits**

**One practical period of 2 hrs per week over a semester- 1 credit**

#### **Paper –II (Inorganic, Organic, Physical & General Chemistry)**

Course Outcomes:-

- CO.1 General properties like Ionic radii, variable Oxidation states of d-block elements.

CO.2 Get familiarized with free electron theory to explain thermal and electrical conductivity of metals and how band theory can help in understanding properties of conductors and insulators.

CO.3 To know the characteristic reactions of alkyl halides. ( SN1&SN2).

CO.4 To know the electrophilic substitution reactions takes place at preferable positions in polynuclear hydrocarbons.

CO.5 Students will be able to calculate the molecular weights of proteins and calculations of colligative properties.

CO.6 Students will be able to practically determine the colligative properties using experimental methods.

CO.7 Students will gain understanding of the distinction between qualitative and quantitative chemical analysis.

CO.8 The application of statistical method for evaluation of laboratory data based on titrations , separations

## **QUALITATIVE ANALYSIS - II**

### **Course Outcomes:-**

The students acquire practical skills by applying solubility product in qualitative detection of cations in a given salt mixture.

**Four theory period of 1 hr per week over a semester- 4 credits**

**One practical period of 2 hrs per week over a semester- 1 credit**

### **PAPER-III (Inorganic, Organic, Physical & General Chemistry)**

### **Course Outcomes:-**

CO.1 The students know about general trends in atomic and ionic radii,

Oxidation states of lanthanides.

CO.2 To learn which reactions are possible in aldehydes & ketones.

(Nucleophilic addition reaction.)

CO.3 Explains the characteristic reactions of alcohols.

CO.4 To know the difference between alcohols and phenols and explain the acidity of phenols and Reactions of epoxides.

CO.5 Able to hypothesise the Phase equilibria of water system, Ag-Pb and

KI – water system.

CO.6 Discuss the classification preparation & properties of colloids & Micelles

CO.7 Understand the principles of symmetry operations applied to several

Molecules.

CO.8 Appreciates the importance of stereochemistry in organic chemistry

And applies the knowledge gained in this course to variety of chemical

Problems.

### **QUANTITATIVE ANALYSIS -I**

#### **Outcomes:**

CO.1 Familiarizes with basic principles of volumetric titrations

CO. 2 Acquires practical skills in quantitative estimation using acidimetry and alkalimetry.

**Four theory period of 1 hr per week over a semester- 4 credits**

**One practical period of 2 hrs per week over a semester- 1 credit**

### **PAPER – IV (Inorganic, Organic, Physical & General Chemistry)**

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

CO.1 Discuss IUPAC nomenclature in naming Coordination complexes and the nature of bonding in coordination complexes.

CO.2 Apply EAN rule and explain stability of metal carbonyls, nitrosyls and metallocenes.

CO.3 Explains the synthetic applications of Carboxylic acids and aceto acetic ester.

CO.4 Able to prepare Galvanic cell and to calculate transport number and

apply Arrhenius theory and Debye-Huckel theory for dissociation of

Electrolytes.

CO.5 Able to standardize different solutions using potentiometric titration

in the lab and calculate pH using Quinhydrone electrode.

CO.6 Understands symmetry properties of HOMO,LUMO & types of pericyclic reactions.

CO.7 Explanation of stereo selective & stereo specific reactions.

### **QUANTITATIVE ANALYSIS -II**

CO.1 Enabled to strengthen the laboratory skills, techniques, understanding the theoretical principles of physical electro analytical techniques.

CO.2 Students will be able to know Gravimetric Analysis

**Four theory period of 1 hr per week over a semester- 4 credits**

**One practical period of 2 hrs per week over a semester- 1 credit**

### **PAPER- V (Inorganic, Organic, Physical & General Chemistry)**

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

CO.1 The students can apply IUPAC nomenclature in naming Coordination complexes.

CO.2 Study Werner's, Sidgwick's, VBT and CFT.

CO.3 Differentiate between stepwise and overall formation (equilibrium)

Constants. Account for the trend in stepwise formation constants and reasons for exceptions

CO.4 The students know factors effecting stability constants and apply Job's method and Mole ratio method in determination of stability constants of coordination complexes

**CO.5** To know the classification, preparation and properties of nitrogen compounds.

CO.6 Students analyze the factors affecting the rate of a reaction and calculate the order of reaction.

CO.7 Study about Laws governing Photochemistry and Jablonskii diagram.

CO.8 To learn classification and importance of Heterocyclic compounds

**Practical :**

CO.1 The students will acquire the practical skills by applying techniques of chromatography (TLC & Column)

CO.2 Synthesis of Organic compounds

**PAPER- VI (Inorganic, Organic, Physical & General Chemistry)**

CO.1 The students get familiarized with basic principles of separation techniques

CO.2 To get expertise in classical and modern chromatography techniques(TLC,GC,PC,CC,HPLC,IEC)

CO.3 To able to know the classification and therapeutic actions of various drugs

CO.4 Discuss the synthesis of drugs like paracetamol, Ibuprofen, ciprofloxacin etc.

CO.5 Students can identify macromolecules and its synthesis.

CO.6 Understands the mechanism of drug action of different drugs on HIV.

CO.7 Enables to synthesise the Organic Compounds by using Green chemistry principles and also gains the knowledge about Microwave and Ultrasound assisted Organic synthesis.

**PRACTICAL PAPER - VI****Outcomes:-**

CO.1 Students get acquainted with the order of the reactions.

CO.2 Enabled to determine the viscosity & surface tension of different liquids.

**6 theory period of 1 hr per week over a semester- 6 credits**

**One practical period of 3 hrs per week over a semester-1 credit.**

**PAPER- VII****Course Outcomes:**

CO.1 Differentiate between stepwise and overall formation (equilibrium)

Constants. Account for the trend in stepwise formation constants and reasons for exceptions

CO.2 Factors effecting stability constants and apply Job's method and Mole ratio method in determination of stability constants of coordination complexes



CO.3 Can know the importance of Carbohydrates in our daily life and their structures.

CO.4 To know the biological functions of amino acids & Proteins.

CO.5 Able to understand the spontaneous, non spontaneous reaction conditions.

CO.6 To interpret the spectral data & fragmentation of different compounds.

CO.7 To know the structure & functions of Haemoglobin, chlorophyll.

#### **PRACTICAL PAPER -VII**

CO.1 The students will acquire the practical skills by applying solubility & functional group tests in a given organic compounds.

#### **PAPER - VIII**

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

CO.1 Able to interpret the molecular spectroscopy (UV, IR, Raman ,NMR).

CO.2 Able to understand the Green chemistry principles and Green synthesis & Green catalysis.

CO.3 To develop and understanding of ways in which enzyme catalyzed reactions including general acid, base catalysis ,cofactor analysis and covalent Catalysis.

CO.4 To able to understand the industrial applications of coordination compounds

CO.5 Interpretation of spectral data

CO.6 Applications of nonmaterial's (Fullerenes & CNTS)

#### **PRACTICAL PAPER -VIII**

CO.1 Students get enabled to strengthen the laboratory skills, techniques, understanding the theoretical principles of electro analytical techniques.

**6 theory period of 1 hr per week over a semester- 6 credits**

**One practical period of 3 hrs per week over a semester-1 credit**