Government Autonomous Post Graduate College CHHINDWARA (M.P.)
ACCREDITED by NAAC at B GRADE With CGPA 2.80
STUDENTS PROGRAMME OUTCOMES AND COURSE OUTCOMES

Department of Commerce

Programme Outcomes

After completing three years for Bachelors in Commerce (B. Com) program, students would gain a thorough grounding in the fundamentals of Commerce and Finance.

PO 1 The commerce and finance focused curriculum offers a number of specializations and practical exposure which would equip the student to face the modern-day challenges in commerce and business.

PO - 2 This program could provide Industries,Banking Sectors, Insurance Companies, Financing companies, Transport Agencies, Warehousing etc.' well trained professionals to meet the requirements.

PO- 3 After completing graduation, student can get skills regarding various aspects like Marketing Manager, Selling Manager, over all Administration abilities of the Company.

PO -4 Capability of the student to make decisions at personal and professionals level will increase after completion of this course.

PO - 5 Students can independently start up their own Business.

PO- 6 Student can get thorough knowledge of finance and commerce.

PO -7 The knowledge of different specialization in Accounting, costing, banking and finance with the practical exposure helps the student to stand in organization.

B.COM – FIRST YEAR

Accounting Group : I Financial Accounting

Course Outcome - On Completion of this course students will be able to:

1. Describe, explain, and integrate fundamental concepts underlying accounting, finance, management, marketing and economics.
2. Use information to support business processes and practices, such as problem analysis and decision making.
3. Apply quantitative skills to help analyze and solve business problems and to take advantage of business opportunities.
4. Describe and explain the ethical and social responsibilities of accountants in ensuring the integrity of financial information.
5. Develop an understanding of internal control issues and the effects of the regulatory environment on financial reporting.
6. Apply knowledge of generally accepted accounting principles (GAAP) and managerial accounting theories to business organizations and nonprofit organizations.

Accounting Group : II Business Mathematics

Course Outcome - On Completion of this course students will be able to:

1- Student will learn about the Gaining ratio, sacrificing ratio, proportion, percentage, commission and discount.
2- Explain the concepts and use equations, formulae, and mathematical expressions and relationships in a variety of contexts.
3- Apply the knowledge in mathematics (algebra, matrices, calculus) in solving business problems.
4- Analyze and demonstrate mathematical skills required in mathematically intensive areas in Economics and business.
5- Integrate concept in international business concepts with functioning of global trade.

Management Group : I Business Law

Student will be able to learn following topics.

1- Nature of contract, offer and Acceptance.
2- Remedies for breach of contract.
3- Dishonor and discharge of negotiable instruments.
4- Consumer protection Act, main provisions, consumer Disputes and Redressed Machinery.
5- Foreign exchange management Act. 2000, introduction to Intellectual property right Act.

Management Group : II Business organization and communication

Course Outcome - On Completion of this course students will be able to:

1. Explain the concept of business.

2. Distinguish between for-profit and nonprofit businesses.

3. List and explain the four factors of production required to sustain a business.

4. Identify the primary functional areas within a business and describe their contribution to the organization.

5. Explain the stages of team development and the factors that contribute to team success.

Applied Economics Group :- I Micro Economics

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

1- Explain what economics is and explain why it is important.
2- Use mathematics in common economic applications.
3- Use graphs in common economic application.
4- Describe and differentiate between major economic systems.
5- Explain the determinants of demand.
6- Explain the determinants of supply.
7- Explain and graphically illustrate market equilibrium, surplus and shortage.

Applied Economics Group:- II Macro Economics

Student will be able to learn the following topics :-

1- Explains national income, calculation methods of national income, and concepts related to national income.
2- Defines concepts related to national income.
3- Compares calculation methods of national income.
4- Relates factors determine national income such as consumption saving and investment.
5- Learn about the theory of employment and interest.
6- Learn about industrial and monitory policy.

B.COM – SECOND YEAR

Accounts group:- I Corporate Accounting

Student will be able to learn following topics-
1- Formation of company and making final accounts of company along with transaction of share capital.
2- Learn accounts of public utility concerns.
3- Accounts of holding and subsidiaries company.
4- Accounting for merger as per accounting standered-14.
5- Accounts of banking and insurance company with claim settlement.

Account Group :- II Cost Accounting

1 Understand various costing systems, cost and cost control.
2 Analyses and provide recommendation to improve the operation of organization through the application of cost accounting techniques.
3 Evaluate the cost and benefits of different conventional and contemporary costing.
4 Learn stock management and different methods of calculation stock consumption.
5 Learn to apply cost accounting methods for both manifesting and service industry.

Management Group :- I Principles of statistics

After the completion of the course, the student will be able to

1- Students will summarize data visually and numerically.
2- Student will learn and apply the tools of formal inference.
3- Students will learn the mathematical and probabilistic foundations of statistical inference.
4- Ability to apply various statistical tools to research problem.
5- Understanding how to collect, present, analyze and interpret the data.
6- Ability to analyze the data by using MS-Excel.
7- Knowing the statistical organization in India and Abroad.

ManagementGroup : II Principles of Management

On completion of this course, the students will be able to learn the following topics:

1- Understand the concepts related to Business.
2- Demonstrate the roles, skills and functions of management.
3- Analyze effective application of knowledge to diagnose and solve organizational problems and develop optimal managerial decisions.
4- Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.

Applied Economics Group: I Indian Company Act

Student will be able to learn following topics

1- Indian company Act 2013, Formation of company.
2- Memorandum of Association, Articles of Association prospectus.
3- Share and Share holders, Debenture meaning and types.
4- Directors- their qualification, appointment, powers and duties and Company meeting.
5- Majority power and Minority rights.

Applied Economics Group :II Banking & Insurance

On Completion of this course students will be able to:

1- Understand the risks faced by banks and ways to overcome-them.
2- Understand the difference between life and non life insurance.
3- Understand how to choose life insurance policies based on their needs.
4- To understand essence of commercial banking business .
5- To examine latest trends and regulations in commercial banking arena.
6- To become proficient in management of various aspects of commercial banking.

B.Com. III rdYEAR

Accounts Group: I Income Tax law & practice

Course Outcomes : On completion of this course, the students will be able to:

1- Knowledge about the income tax Act and residential status.
2- Knowledge about the Income from salaries and house property.
3- Description about the profit or gain of business, profession and income from other sources.
4- Knowledge about capital gain and dedications.
5- To know the set off and carry forward of losses.
6- Computation of tax liability and assessment of individuals.

Accounts Group :- II Goods and service tax and custom duty

Student will be able to learn the following topics :-

1- Understand various terms related to goods and service tax (GST).
2- Understand the difference between forward charge and reverse charge mechanism.
3- Determine the time, place and value of supply.
4- Know the contents and format for various document like tax invoice, bill of supply, debit note, credit note etc.
5 Compute the amount of CGST, SGST and IGST payable after considering the eligible input tax credit.
6 Determine whether a person is required to obtain registration under GST law.

Management Group: Paper I Auditing

Student will be able to learn following topics-
1- Introduction and objectives of auditing, types of Audits and Audit programme.
2- Internal checking, Internal Audit, Internal control and Audit procedure.

3- Vouching and Verification of Assets and liabilities.
4- Company audit and Auditor's Report.
5- Investigation, special Audit of banning companies, audit of educational, Non profit institutions and insurance companies.

Management group: Paper II Management Accounting

Student will be able to learn following topics

1 Concept of management accounting, tools and techniques of management Accounting and their role in decision making.

2 Learn the concepts of financial statement analysis, different methods of financial statement analysis, their utility and limitations.

3 Will learn marginal codling and its use in decision making.

4 Will learn concept of budget, budgetary control and different type of budget.

5 Learn management, audit, responsibility,accounting and preparation of management reports.

Applied Economics Group B: Paper I – Principels of Marketing

Student will be able to learn following points.

1- Marketing concept :- Traditional and Modern concept and its Importance with marketing Environment.

2Know about consumer behaviour and marketing segmentation.

3 Concept of product, Brand and Trademark.

4 Importance of price in the Marketing Mix.

5 Learn about sales promotion and advertising media.

Applied Economics Group B : Paper II international Marketing

Student will be able to learn the following points-

1- International marketing and difference between domestic marketing v/s International marketing .
2- Product planning for International Market.
3- International pricing and price Quotation and payments Conditions.
4- Distribution channels and logistics decisions.
5- Indian Import Export policy and practice.

M. com: Programme Outcomes

After completion of the course, student will be able:

PO1 To inculcate the knowledge of business and the techniques of managing the business with special focus on marketing, Insurance and banking theory law and practices.

PO 2 To impart the knowledge basic accounting principles and the latest application oriented corporate accounting methods.

PO 3 To develop the decision making skill through costing methods and practical application of management accounting principles.

PO 4 To enhance the horizon of knowledge in various field of commerce through advertising and sales promotion, auditing and entrepreneurial development.

PO5 To enhance the computer literacy and its applicability in business through latest version on tally and e-commerce principles.

PO 6 To create awareness in application oriented research through research or business decisions.

M. COM – FIRST SEMESTER

Paper I :- Management Concept

Student will be able to learn the following points-

CO1 Concept of Management and its Importance.
CO2 Planning :- Objectives and components of planning
CO3 Importance of Decision making.

CO4Organization and its structure.

CO5 Direction and effective communication.

Paper II-Business Environment

At the end of the course, student should be able to:
CO1 Discuss the supply and demand theory and its impact on insurance.
CO2 Explain the effects of government policy on the economic environment and insurance industry.

CO3 Outline how an entity operates in a business environment.

CO4 Describe how financial information is utilized in business.

CO5 Explain the legal framework that regulates the insurance industry.

Paper III – Advanced Accounting

Student will be able to learn the following topics-

CO1Advanced problems of final Accounts.
CO2 Bank Reconciliation statements.
CO3 Accounting from Inconcplete Records.

CO4 Investment and insolvency Accounts.

CO5 Dissolution of partnership firm,

Paper- IV Cost Analysis and control

Student will able to learn the following:

CO1 Various Cost concepts, Cost center, Costing system and their installation in the organization.

CO 2 Will learn process costing technique of cost ascertainment.

CO3 Learn the concept of marginal costing.

CO4 Concept of Budget, budget types and cost audit.

CO5 Will learn the standard costing and variance analysis

M.Com. II sem

Paper I-Corporate legal frame work

CO1 Indian company act 2013, memorandum of association and Articles of association.

CO2 Negotiable Instrument Act 1881.

CO3 Indian partnership Act. 1932

CO4 Consumer protection act.

CO 5 FEMA, WTO, principles and its characters.

Paper II- Organizational Behavior

After completion of the course, student will be able to learn following topic:

CO1 Describe the general history of management theory and practice and frame how organization behavior has developed from these into a discreet field.

CO 2 Describe organizational behavior and differentiate between the three levels of influence.

CO 3 Describe contemporary issues and topics in organizational behavior.

Paper III :Advance Statistical Analysis

CO1 Students will summarize data visually and numerically.
CO2 Student will build and assess data-based models.
CO 3 Student will learn and apply the tools of formal inference.
CO 4 Student will learn the mathematical and probabilistic foundations of statistical inference.
CO 5 Student will execute statistical with professional software.

Paper IV : Functional Management

Student will be able to learn the following points.

CO1Financial Management and financial planning.

CO2 Capitalization and capital structure.

CO 3 Marketing Management and its functions.

CO4 Advertising, Personal Management, Man power planning Recruitment, selection and training.

CO5 Production Management and product diversification.

M. COM – THIRD SEMESTER

Paper I Managerial Economics

On completion of this course, the students will be able to learn the following topics:

CO1Ability to forecast demand in light of changing circumstances and to formulate business plans.

CO2 Ability to chalk out Business policies.

CO3Knowledge about profit Planning and control.

CO4 Skill to analyze effects of Government policies.

Paper –II Tax Planning& Management

On completion of this course, the students will be able to learn the following topics

CO 1 Ability to identify the difference between Tax evasion, Tax planning and tax Avoidance.

CO 2 Understanding of various deductions, rebates and reliefs to reduce the taxable income and tax liability.

CO3 Skill to take managerial decision keeping in view the income tax rules.

CO 4 Knowledge of double taxation avoidance agreement.

Paper-III Entrepreneurship skill development

student will be able to learn the following topics **:**

CO1 Have the ability to discern distinct entrepreneurial traits.

CO 2 Know the parameters to assess opportunities and constraints for new business ideas.

CO 3 Understand the systematic process to select and screen a business idea.

CO 4 Design strategies for successful implementation of ideas.

CO 5 Student will learn to write a business plan.

***Paper- IV Accounting for managerial divisions*.**

Student will be able to learn the following.

CO1 Learn different activity based management tools that facilitates in decision making.

CO2 Learn cost- volume-profit Analysis technique to determine different optional managerial decisions.

CO3 Perform cost variance analysis and demonstrate the use of standard cost in flexible budgeting.

CO4 Calculate various accounting ratios, reports and trade analysis.

CO5 Prepare analysis of various special divisions using relevant management techniques.

M.COM – FOURTH SEMESTER

Paper I : Advertising and sales Management

Student will be able to learn the following points

CO 1 Advertising and role of advertising in marketing media.

CO 2 Determination of target audience and Advertising media.

CO 3 Promotional Management and Advertising department.

CO 4 Personal selling.

CO 5 Sales Management and sales Organisation.

Paper II Consumer Behavior

Course outcomes on completion of this course, the student will be able to:

CO1 Demonstrate how knowledge of Consumer behavior can be applied to marketing

CO2 Identify and explain factors which influence consumer behavior.

CO3 Relate internal dynamics such as personality, perception, learning motivation and attitude to the choices consumers make.

CO4 Use appropriate research approaches including sampling, data collection and questionnaire design for specific marketing situations.

CO 5 In a team, work effectively to prepare a research report on consumer behavior issues within a specific context.

Paper III Rural and Agriculture marketing

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

CO1 The concept of agricultural marketing, its scope and classification of agricultural products and there deference with manufactured goods.

CO2The student will know about image of Indian rural marketing and approach to rural markets of India.

CO3 student will learn about the forward market, exchange market, cash market, action market and forward dealing in relation to agricultural marketing.

CO 4 Rural market in India, regulated market and limitation in present regulated agricultural market in India.

CO 5 Marketing of form product, packing and packaging, material and there transportation advantages.

Paper-IV International marketing

Students will be able to learn the following topics:

CO 1 Have developed an understanding of major issues related to international marketing.

CO 2 Have developed skills in researching and analyzing trends in global markets and in modern marketing practice.

CO3 Able to assess an organization's ability to enter and compete in international markets.

CO 4 Importance of global and international marketing.

CO 5 Motives to internationalization. The influence of macro-environment on market selection.

STUDENTS PROGRAMME OUTCOMES AND COURSE OUTCOMES FOR BBA COURSE

PROGRAMME OUTCOMES

PO1 To provide adequate basic understanding about Management Education among the students.

PO2 To prepare students to exploit opportunities being newly created I the Management Profession.

PO3 To train the students in communication skills effectively.

PO4 To develop appropriate skills in the students so as to make them competent and provide themselves self-employment.

PO5 To recognize and solve business problems in an ethical manner . PO6 To communicate business information professionally.

PO7 To understand finance and other core business content.

AT THE END OF THE COURSE, STUDENTS SHOULD BE ABLE TO:-

FOR BBA-I YEA

GROUP –I

PAPER –I "PRINCIPLES OF MANAGENENT"

- Functions and responsibilities of management,roal of manager & functional areas of management.
- Planning process & planning vs forecasting.
- Nature and purpose of organaizing,departmentation& organisational structures and design.
- Direction principels & tecniques,motivation,maslow's need hierchy,theory w & y of motivation leadership.
- Controlling the system and process of controlling & swot analysis.

PAPER-II "COMMUNICATION SKILLS"

- Definition and process of communication,role of communication in organizational effectievness.
- Public speech & group discussion do's and don'ts of gd's communication in commitees.
- Difference between listening and hearing.
- Drafting of notices,agendas,minutes,job application letters preparation of curricular vitae.

- Business correspondence,structure of bussiness letter types of business letter & enquiry reply orders complaints circular letter.

GROUP-II

PAPER-I "MICRO ECONOMICS"

- Nature and scope of economics & significance and evolution of micro economics.
- Concept and law of demand,law of supply & elasticity of demand determinates.
- Utility analysis,marginal concept of utility & theory of consumer surplus.
- Element of cost & theory of rent.
- National income estimates and analysis & types of market structure,perfect vs imperfect market, trade cyclpaper-ii "business statistics"
- Meaning and definition of statistics, statistical investigations.
- Collection of data & primary and secondary data.
- Measures of central tendencies mearn,median,mode,geometric mean,harmonic mean.
- Measure of variation standard deviation, mean deviation and akewness,time series analysis.
- Correlation & regression analysis,karl pearson's co-efficient of correlation & regression.

GROUP-III

Paper-i "financial accounting"

- Accounting and its place in business and relationship with other financial areas, double entry system, book keeping, management accounting-concept,need,importance & scope.
- Types of books of accounts and their preparation journal,ledger,trial balance deprection.
- Preparation of final account tranding account,profit & loss account balance sheet.
- Cost accounting records and processes,bank reconciliction statement.
- Hire purchase accounts accounting record in the book of purchasee and vendor,budget and budgetory control.

Paper-ii "business mathematics"

- Introduction to sets.
- Linear equations in two variable & quadractic equations.
- Determinants and matrices, adjoint and inverse of martix.
- Limits,continuty and logarithm,differential calculus.
- Calclus integral calculas standard formulas on algebraic,maxima and minima functions.
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FOR BBA-II YEAR

GROUP-IV

Paper- i "marketing management"

- Nature and scope of marketing, selling vs marketing,approaches.
- Market segmentation,marketing mix.
- Product strategy,product cllasification & product mix,branding and pakaging decision.
- Princing decision,methods of setting prices,consumer behaviour and decision making.
- Channel of distribution,types of intermediaries and their roles. Paper- ii "marketing

research"

- Problem formulation and statement of research,research process.
- Method of data collection-observational and survey methods,questionaire design attitude meansurement techniques.
- Administration of surveys,sample design,tabulation and analysis of data.
- Concept and objectives of marketing research,advantages and limitations of marketing research.
- Tyoes of marketing research,consumer research,product research,sales research and advertising research.

GROUP- V

Paper-i "financial management"

- Finance function and its objectives,capitalization,over capitalization analysis,under capitalization.
- Ratio analysis,funds flow and cash flow analysi.
- Working capital management, capital structure,financial and operating leverage.
- Capital budgeting,methods of investmentevaluation.
- Detemination of dividend policy & types of dividend policy,hire purchase and venture capital.

Paper-ii "project management"

- Genration and screening of project idea,capital expenditure.
- Market demand & situational analysis,analysis of project risk.
- Multipal projects & constraints,network techniques for project management.
- Project financing in india.
- Assessment of tax burden of various projects,environmental appraisal of projects-financial & technical envionment.

GROUP-VI

PAPER- I "HUMAN RESEARCH MANAGEMENT"

- Concept and functions of human resource management,the future challenge of hrm.
- Strategic management of human resource,staffing policy and process.
- Manpower traning & development,employment training and development.
- Wage & salary administration,compensation management and benefits.
- Management of organisational climate & industrial relation,conflict management and negotation.

PAPER- II "ORGANIZATIONAL BEHAVIOUR

- Concept of organisational behaviour,contributing discliplines to organisational behaviour.
- Individual behaviour,peronality perception-perceptual selectivity.
- Leadership concept and theories of leadership,group dynamics group formation.
- Stress management meaning, cause,effect,and coping strategies for stress.
- International dimesions of organisational behaviour.

FOR BBA- III YEAR

GROUP- VII

PAPER-I "ENTREPRENEURIAL DEVELOPMENT"

- Concept and nature of enterepreneurship and ssi,role and importance of entrepreneur in economic growth.
- Entrepreneurial devlopment programmes in india.
- Entrepreneurial behavior and entrepreneurial motivation.
- Establishing entrepreenur system,spurces of ideas,idea processing.
- Sources and criteria of financing,fixed and working capital assessment.

PAPER-II "MANAGEMENT INFORMATION SYSTEM"

- Managerial information system definition basic concepts frame work,e-business & e-governance.
- Systems approach to mis,knowledge based enterprise-system & processes.
- Mis structures on the basic of management activity and organisational functions.
- Need of information,levels of information handling.
- Data flow diagram,data dictionary,data base manaagment system (dbms).

GROUP- VIII

PAPER-I "BUSINESS ENVIRONMENT"

- Introduction to business environment, role of environment in business.
- Economics & political enviornment, role of government in business.
- Technological environment.
- Culture & business.
- Global business environment.

PAPER-II "BUSINESS LAW"

- Contract act: essentials of a valid contract.
- Bailment & pledge,agency,law of consumer protection.
- Company: formation of a company,prospectus.
- Law of sales of goods: conditions and warranties.
- Negotiable instruments act 1881,fema.

GROUP- IX (ELECTIVES:-MARKERTING)

PAPER-I "CONSUMER BEHAVIOUR"

- Introduction to consumer behaviour.
- Consumer decision making process.
- Consumer motivation,need and goals,positive and negative motivation.
- Consumer attitude and change.
- Reference group influence.

PAPER- II "ADVERTISING MANAGEMENT & SALES PROMOTION"

- Definition,objectives,functions and classification of advertisement.
- Advertising vs other formes of mass communication,communication mix.
- Media planing – media characteristics.
- Sales promotion-meaning and importance of sales promotion.
- Trade oriented sales promotion.

Department of Arts

Programme Outcomes Of B.A. :-

Communication Skills: a) Ability to speak and write clearly in standard, academic English b) Ability to listen to and read carefully various viewpoints and engage with them.

Critical Thinking:- Ability to place texts in historical contexts and also read them in terms of generic conventions and literary history.

Problem Solving: a) Ability to transfer literary critical skills to read other cultural texts b) Ability to read any unfamiliar literary texts

Scientific Reasoning: Ability to analyse texts, evaluating ideas and literary strategies

Reflective Thinking: ability to locate oneself and see the influence of location—regional, national, global—on critical thinking and reading.

Multicultural Competence: Ability to engage with and understand literature from various nations and reasons and languages.

Life-long Learning: Ability to transfer such skills to other domains of one's life and work

Programme Specific Outcomes :B.A. –Geography

PSO 1. Acquiring knowledge of physical geography student will have a general understanding about the geomorphologic and geotechnical process and formation. They will be able to correlate the knowledge of physical geography with the human geography.

PSO 2. Acquiring knowledge of Human geography they will be able to enquire the knowledge of human geography and will correlate it with their practical life.

PSO 3. Ability of problem Analysis.

PSO 4. Conduct social survey project.

PSO 5. Application of modern instruments- student will be able to learn the application of various modern instruments and by these they will be able to collect primary data.

PSO 6. Application of GIS and modern geographical Map making techniques.

PSO 7. Development of observation power.

PSO 8. Development of Communication skill and International power.

PSO 9. Understand Environmental Ethics and sustainability.

PSO 10. Life Long teaming lifelong learning in the broadest context of societal and environmental change.

B.A.I Year

Paper I Physical Geography (Lithosphere)

1. Understand different theories of the earth.
2. Gain knowledge about earth's interior.
3. Develop on idea concept of earth's movements and related topography.
4. Acquire knowledge about different process of denudation.
5. Understand the processes of erosion, deposition and resulting landforms.
6. Understand concept of normal cycle of erosion and its interruption.

Paper II Human Geography

1. The students will be aware of the scope and contents of Human geography.
2. Man's adaptation in various environment.
3. The population module aims to develop an idea about the world population distribution and the factors that lead to uneven distribution of the population.
4. Different types of settlement and characteristics their definition.

Paper III Practical Geography

1. Development an idea about scale and draw different types of scale like linear, diagonal and venire.
2. Know about diagrammatic data presentation like line, bar and circle.
3. Gain knowledge about representation of relief, learn basic principle of surveying and chain tape survey.

BA II year

Paper I Physical Geography

CO 1. Student will learn the process of interaction between the atmosphere and the earth's surface.

CO 2. They will be able to understand the importance of the ozone layer and bag effect of greenhouse gasses moreover will be eligible to apply this for the solution of environmental problem.

CO 3. They understand how the planetary and periodic wind and pressure belt related to each other also they understand how to develop the tropical cyclones, Elmina and to Nina.

CO 4. Student can explain the important role of water to create condensation and precipitation.

CO 5. Develop an idea about types of coastal landforms.

CO 6. Acquire knowledge about hydrology.

Paper II : (Economic Geography)

CO 1. Understand the concept of economic activity factors affecting location of economic activity.

CO 2. Gain knowledge about different types of primary activates.

CO 3. Development and idea about different types of secondary activities.

CO 4. Acquire knowledge about different types of tertiary activities.

CO 5. Understand different types of economics activities.

CO 6. Identify forming in humid tropics.

B.A.II Year Practical

CO 1. Learn to use of various meteorological instruments.

CO 2. Gain knowledge about Indian tally weather report.

CO 3. Learning about prismatic surveying.

CO 4. Learn to draw monthly temperature and rainfall graphs.

B.A. III Year

Paper I : Geography of India

1. They can know about their own countries our state land formation, climate and natural vegetation.

2. They understand the population problems In India Access the population policies and reaction the countries.

3. They understand globalization and Indian economy and also understand the regional distribution of resource.

4. Develop an idea about regionalization of India.

Paper II: Environment and Resource management

CO1. Gain knowledge about concept, nature, components of environment.

CO2. Develop an idea about human environment relationships.

CO3. Build an idea about ecosystem.

CO4. Develop an idea about management of disasters.

CO5. Gain knowledge of environmental issue ie Quality of human life Industrialization and

environment.

CO6. Understanding the environmental programmers and policies at local as well as global level.

B.A. III Year Practical

CO 1. Gain knowledge about topographical maps and apply this knowledge in ground surface.

CO 2. Acquire knowledge different types of map projection.

CO 3. Lessons on different statistical methods used in practical geography e.g. Frequency, mean, median and mode etc.

CO 4. They can know about the interpretation of air photographs and satellite imagery.

Program Outcome: M.A.- Geography

PO 1. As a student of Geography course they will be capable to develop their observation power through field experience and in future, they will be able to identify the socio-environmental problems of a locality PO 2. Conduct social survey project.

PO 2. Application of modern instruments.

PO 3 Application of GIS and modern geographical map making Techniques.

PO 4. Development of communication skill and interaction power.

PO 5. Enhancement of the ability of management.

PO 6 Understand Environmental Ethics and sustainability.

PO 7. Self-directed and life-long Learning.

PO 8. To develop the design and conduct independent research.

PO 9. A Geographer has better job opportunities in government departments, Cartographer, Researcher, Teacher/professor, competitive Examinations, government. Employer, GIS specialist, climatologist, Transportation manager, surveyor, GPS Surveyors.

M.A. Ist Semester

Paper I: Geomorphology

CO 1. Develop an idea about geomorphology and different types of fundamental concepts.

CO 2. Explain different types of geomorphic processes like weathering and mass wasting and cycle of erosion.

CO 3. Understand the processes of erosion, deposition and resulting landforms.

CO 4.Acqure knowledge about slope forms and processes.

CO 5. Develop an idea about concept of plate tectonics and resultant land forms.

Paper II: Economic Geography

CO 1.This module deals with the scope and content of economic geography, economic activities primary, secondary tertiary.

CO 2.Focuses on the concept of agricultural geography, cultivation and their association with different Natural and human conditions of the following cereal crops: wheat, rice. plantation crops: rubber.

CO 3. Definition of power resources, coal petroleum and water.

CO 4. Discussing the factors behind localization of industries with special reference to the study of iron, steel and aluminum Industry.

Paper III: Geography of India: Physical and Resources

CO 1. They can know about their own countries land formation, climate and natural vegetation.

CO 2.They understand the economic resources of India.

CO 3. They understand the social distribution of population of their country.

CO 4. Develop an idea about regionalization of India.

Paper IV: Evolution of Geographical Thoughts

CO 1. Gain knowledge about development of geographical thoughts.
CO 2. Develop an idea about evolution of geographical thinking and disciplinary trends in Germany, France, Britain and United state of America.

CO 3. Build up an idea about between environmental determinism and possibilism, systematic and regional, physical and human.

CO 4. Know about the trends and recent trends of geographical thoughts.

M.A.II semester

Paper I : Climatology

CO 1. Learn the interaction between the atmosphere and the earth's surface.

CO 2. Understand the importance of the atmospheric pressure and winds.

CO 3. Understand how atmospheric moisture work.

CO 4. Develop an idea about cyclones.

CO 5. They will be able to understand the importance of the ozone lay are and bad effect of green house gasses moreover will be eligible to apply this for the solution of environmental problem.

Paper II: Resource Management

CO 1 To familiarize students with the basic concept of resource

CO 2 To offer an insight into current scholarly knowledge in the field of resource evaluation.

CO3 To study the methods and techniques of resource allocation and resource appraisal.

CO4 To apply the concept of resource development, conservation and management

CO 5 To explain the use and misuse of resources in perspectives on global and Indian scenario.

Paper III: Geography of India (Economy and Regions)

CO 1. Understand the Basic of Indian Economy.

CO 2. Understand role of Agriculture green Revolution and Indian Agriculture Growth.

CO 4. Understand role of Industries-Medium, small and micro.

Paper IV: Geography of Environment

CO 1. Gain knowledge about concept, scope of environmental geography and components of environments for Ecosystem.

CO 2.Develop an idea about human environment.

CO 3. Know about environmental programmers and policies.

CO 4.Develop an idea about factors, eon sequences and management of earthquake, landslide, blood and riverbank erosion.

CO 5. Acquire knowledge about human induced disaster.

M.A. III Semester

Paper I: Oceanography

CO 1. Discus the importance of oceanography in global initiatives and political decisions for the present and future.

CO 2.Demonstrate how the oceans are connected to and drive major Earth processes, such as weather and climate, plate tectonics and sustainability of human and marine population.

CO 3. Develop an idea about types of coastal land forms.

CO 4. Acquire knowledge about hydrology.

CO 5. Summarize the major physical and chemical properties of seawater and how each effects life.

Paper II: Urban Geography

CO 1. To acquire knowledge of, Understand and critique key paradigms and approaches in urban geography [e.g. industrial location, urban form, Urban growth neoliberals, gentrification, inequality etc.

CO 2. To be able to link those topics and approaches to specific cases.

CO 3. To develop skills in the critical analysis of Urban theory, Urbanization and Urban problems.

CO 4. To apply your knowledge in an analysis of urban social or public policy.

Paper III: Geography of Tourism

CO1. Equip with a basic understanding of nature scopes trends and patterns of various types of tourisms.

CO 2. Have sound knowledge an geographical environmental and socio cultural aspects of tourism in India.

CO 3. Apply the principles of Geo-tourism and analyze the prospects and problems associated with pilgrimage tourism.

CO 4. Understand the impacts of tourism on national, regional and local economy, environments and society.

Paper IV: Agriculture Geography

CO1. Conceptualize the agriculture and its determinants.

CO 2. Get the over view of Indian and world agriculture regions and systems.

CO 3. Understand the determinants of agriculture activities that lead to spatial variation.

CO 4. Identify agricultural regions with reference to India and understand the evaluation and development of these regions.

M.A. IV Semester

Paper I : Research Methodology

CO 1. Learn the significance of field work in geographical studies.

CO 2. Understand the meaning of field and identifying the case study.

CO 3. Develop an idea about search problems.

CO 4. Student should be able to distinguish a purpose statement a research question on hypothesis, and a research objective.

CO 5. Students should be now the steps in the process of data collection.

Paper II : Remote sensing

CO 1. Appreciate the development and user of areal and satellite remote sensing system and navigation satellite systems in India and other nations.

CO 2. Analyze and interpret the aerial and satellite date products and GNSS/GPS survey results.

CO 3. Develop basic understanding of GIS and GPS.

Paper III: Population Geography

CO 1 Gain knowledge different aspects of population geography.

CO 2. Develop an idea about the concept of migration.

CO 3. Understand the Nature of population know about composition of population like- age, sex marital status, family, economic composition and language.

CO 4. Analyze the global trend and patterns population growth in developing countries, and migration patterns.

CO 5. Understand the population policies in different countries.

Paper IV: Biogeography

CO 1. Students can learn the significance of biogeography.

CO 2. Understand of vegetation as an index of climate.

CO 3. Assess of different aspects of floral and faunal provinces.

CO 4 Student can illustrate the importance about bio-diversity and wetlands.

Programe Out Come

हिन्दी विभाग

1- **आधार पाठ्यक्रम**;स्नातक) **P01**

नैतिकमूल्यों का संवर्धनकरपायेंगे।भाषाप्रयोगमेंसुधारकरपायेंगे।

2. हिन्दी साहित्य;स्नातक)**P02**

मानवीय मूल्यों की स्थापना में सहायक साहित्य का अध्ययन करप ायेंगे।

विभिन्न साहित्यिकि वधाओं से परिचित हो पायेंगे।

३. प्रयोजन मूलक हिन्दी; स्नातक)) **P03**

राजभाषा के प्रचार प्रसार मे ंसहयोगी बन पायेंगे। हिन्दी के
व्यवहारिक अनुप्रयोग सीख पायेंगे।

४. हिन्दी; स्नातकोत्तर))**P04**

सृजनात्मक लेखन क्षमता विकसित कर पायेंगे।
श्रेष्ठ रचनाओं के अध्ययन करन ेपर पाठकीय क्षमता मे ंवृद्धि कर पायेंगे।
साहित्य का वि"ाष्ट ज्ञान प्राप्त कर पायेंगे। प्रतियोगी परीक्षाओ ंहेत ुभाषा
ज्ञानअर्जित कर पायेंगे।

Course Out Come/ learning Out Come

हिन्दी विभाग आधार पाठ्यक्रम

1- कक्षा –बी.ए/बी.काम./बी.एस. सी. प्रथम वर्ष
प्रश्नपत्र नाम –हिन्दी भाषा एवं नैतिक मूल्य

Course Out Come- छात्र नैतिक मूल्यों के अध्ययन से उनम ेंनैतिकता का विकास होगा, नैतिक मूल्य आत्मसात कर पायेंगे। मातृभाषा, राजभाषा, राष्ट्रभाषा, संपर्क भाषा से परिचित हो पायेंगे।

2- कक्षा –बी.ए/बी.काम./बी.एस. द्वितीय वर्ष
प्रश्नपत्र नाम –हिंदी भाषा एवं नैतिकमूल्य

Course Out Come सांस्कृतिक एकता को बनाये रखने मे ंआवश्यक नैतिक मूल्यों से परिचित हो पायेंगे। भाषा की संप्रेषणीयता में वृद्धि कर पायेंगे।

3- कक्षा –बी.ए/बी.काम./बी.एस. तृतीय वर्ष प्र"नपत्र
नाम –हिंदी भाषा एवं नैतिक मूल्य

Course Out Come

धार्मिक सौहार्द्र को बनाये रखने में सफल हो पायेंगे। हिंदी भाषा में कार्यालयीन पत्र लेखन में दक्ष हो पायेंगे।

हिन्दीसाहित्य (स्नातक) कक्षा –बी ए. प्रथमवर्ष

१ प्रश्नपत्र नाम –प्राचीन एवं मध्य कालीन काव्य

Course Out Come भक्ति कालीन कवियों की रचनाओं के अध्ययन से विद्यार्थियों में आध्यात्मिकता का विकास, परोपकार की भावना, सदाचार जैसे गुण विकसित होंगे। ब्रज एवं अवधी भाषा का तुलनात्मक अध्ययन कर पायेंगे जिससे उनमें अंतर समझ सके।

2. प्रश्नपत्र नाम–हिन्दी कथा साहित्य

Course Out Come

विद्यार्थी, निर्धारित उपन्यास एवं कहानियो ंको पढ़कर विभिन्न सामाजिक समस्याओं को परिचित होकर उनका हल निकालने में सक्ष्म हो पायेंगे। साहित्य के उद्देश्य को समझ पायेंगे।

कक्षा –बी.ए. द्वितीय वर्ष

1 प्रश्नपत्र नाम –अर्वाचीन हिन्दी काव्य

Course Out Come

विद्यार्थी अर्वाचीन काव्य को पढ़कर सामाजिक, आर्थिक, सांस्कृतिक, राजनैतिक आदि चेतना के साथ राष्ट्रीयता का बोध कर पायेंगे समाज का ेमूल्योचित जीवन जीने के लिये प्रेरित कर पायेंगे।

2 प्रश्नपत्र नाम –हिंदी भाषा–साहित्य का इतिहास और काव्यांग विवेचन

Course Out Come

विद्यार्थी हिंदी साहित्य के इतिहास की पृष्ठ भूमि पढ़कर तत्कालीन परिस्थितियों से परिचित हो पायेंगे। रस, छंद, अलंकार का ज्ञान पाकर भाष ाऔर साहित्य की समझ विकसित कर पायेंगे।

कक्षा –बी.ए. तृतीय वर्ष

1 प्रश्नपत्र नाम –प्रयोजन मूलक हिंद

Course Out Come ि

वद्यार्थी प्रिंट एवं इलेक्ट्रानिक मीडिया की जानकारी प्राप्त कर विभिन्न क्षेत्रों में रोजगार प्राप्त कर पायेंगे। कार्यालयीन एवं व्यवसायिक पत्र लेखन सीख पायेंगे।

2 प्रश्नपत्र नाम –हिंदी नाटक निबंध तथा स्कुटगघ विधायें एवं बुंदेली साहित्य भाषा

Course Out Come

विद्यार्थी नाटक, निबंध पढकर सामाजिक पक्षों से अवगत होंगे। बुंदेलीभाषा के अध्ययन से लोकभाषा, लोकसाहित्य एवं स्थानीय बोली से परिचित होकर उनका विकास कर पायेंगे।

प्रयोजनमूलकहिन्दी (स्नातक) कक्षा –बी.ए.

प्रथमवर्ष

1 प्रश्नपत्र नाम –राजभाषा एवंकार्यालयीनहिंदी

Course Out Come

विद्यार्थी हिंदी की प्रयोजनीयता को जान सकेंगे। राजभाषा हिंदी संबधी भारतीय संविधान में दी गयी व्यवस्थाओं से अवगत होंगे।

२ प्रश्नपत्र नाम –व्यवहारिक हिंदी एवं अनुवाद

Course Out Come

कम्प्यूटर और टंकण में दक्षता प्राप्त कर स्वयं का रोजगाार स्थापित कर पायेंगे। श्रेष्ठ अनुवादक बन पायेंगे।

कक्षा –बी.ए. द्वितीय वर्ष

१. प्रश्नपत्र नाम –पत्रकारिता एवं भाषांतरण

Course Out Come

विद्याथी ंपत्रकारिता क्षेत्र में दक्षता प्राप्त कर स्वतंत्र पत्रकार एवं लेखक बन पायेंगे। भाषांतरण एवं दुरदर्शन, आकाशवाणी के क्षेंत्र में रोजगार के अवसर प्राप्त कर पायेंगे। प्रसारण की तकनीक से अवगत हो पायेंगे।

२ प्रश्नपत्र नाम –विज्ञापन प्रेस प्रबंधन एवं आशु लेखन

Course Out Come

विद्यार्थी उदारीकरण के दौर मे ंविज्ञापन के महत्व को जानकर व्यापार व्यवसाय में लाभ प्राप्त कर पायेंगे। पत्रकारिता क्षेत्र में प्रेस की भूमि का जान पायेंगे ंसाथ ही आशुलेखन सीखकर कार्यालय सहायक के पद पर नियुक्त हो सकते हैं।

कक्षा –बी.ए. तृतीय वर्ष

१ प्रश्नपत्र नाम –प्रसारण एवं उद्यमिता के सिंद्धात

Course Out Come

विद्यार्थी स्वरोजगार हेतु उद्यमिता का अध्ययन कर सफल उद्यमी बन पायेंगे। विशैष क्षेत्र में मीडिया से संबंधित उद्योग/प्रकाशन समूह की स्थापना कर पायेंगे।

२ प्रश्नपत्र नाम –कम्प्यूटर और हिंदी

Course Out Come

विद्यार्थी हिंदी भाषा में कम्प्यूटर कार्य करने में दक्ष हो पायेंगे। हिंदी फाण्ट से परिचित हा ेपायेंगे। कम्प्यूटर टंकण में आने वाली समस्याओं का समाधान निकाल पायेंगे।

हिन्दी (स्नातकोत्तर PG)

१. प्रश्न पत्र कोड- P04 – C01

प्रश्नपत्र नाम –प्राचीन एवं मध्य कालीन काव्य

विद्यार्थी ई”ाभक्ति की और उन्मुख हो पायेंगे। निर्धारित कवियों की रचनाओं के अध्ययन से सामाजिक आडम्बर, धुआधूत की भावना से मुक्त हो पायेंगे तथा समाज में समरसता की स्थापना कर पायेंगे।

२. प्र”नपत्र कोड-P04 – C02

प्रश्नपत्र नाम –आधुनिक हिंदी गघ एवं उसका इतिहास

विद्यार्थी समकालीन जीवन के तनाव को समझकर उसे दूर करने में सफल हो पायेंगे। देशभक्ति, मानवसेवा, नैतिकमूल्य, ईमानदारी जैस ेगुणों को आत्मसात कर पायेंगे। व्यंग्य के माध्यम से सामाजिक विसंगतियों को दूर करने में सफल होंगे।

३. प्रश्नपत्र कोड&P04 – C03

प्रश्नपत्र नाम –भारतीय एवं पा"चात्य काव्य शास्त्र
साहित्य सृजन की प्रक्रिया और आवश्यकताओं को समझ पायेंगे। जीवन के गुण–दोषों को समझने की समझ विकसित होती है समालोचना एवं समीक्षा की दृष्टि विकसित होगी।

4- प्रश्नपत्र कोड–P04 – C04

प्र"नपत्र नाम –प्रयोजन मूलक हिंदी
हिंदी भाषा के विविध रूपों से परिचित होंगे। कार्यालयीन हिंदी एवं पारिभाषिक शब्दावली का प्रयोग सीख पायेंगे। कम्प्यूटर और पत्रकारिता के क्षेत्र में पारंगत हो पायेंगे।

५ प्रश्नपत्र – P04 – C05

प्र"नपत्र नाम –आधुनिक हिंदी काव्य और उसका इतिहास कवियों की रचन ाधर्मिता के साथ आदर्श और यथार्थ के समन्वय को जान पायेंगे। स्वांतत्रयोत्तर काव्य के अध्ययन से समस्याओं का ेसुलझाने की दृष्टि उत्पन्न हो पायेगी।

५. प्रश्नपत्र कोड–P04 – C06

प्र"नपत्र नाम–भाषा विज्ञान एवं हिंदी भाषा
भाषा के शुद्ध उच्चारण, लेखन एवं पाठन में सहायता मिलेगी। भाषा से संबधित मूलभूत सिद्धांतो को जानकर दूसरी भाषाओं को सीखने में सहायता मिलेगी।

विष्व भाषा परिवार से परिचित होंगे हिंदी भाषा का भौगोलिक विस्तार, मानकीकरण एवं लिपि के विषय में जानकारी प्राप्त कर पायेंगे।

6- प्रश्नपत्र कोड–P04 – C07

प्रश्नपत्र नाम –हिंदी साहित्य का इतिहास साहित्य इतिहास के पुनर्लेखन की समस्याओं से अवगत हो पायेंगे। हिंदी साहित्य के काल विभाजन और नामकरण के निर्धारण का आधार जान पायेंगे। साथ ाही तत्कालीन समाज से परिचित हो पायेंगे।

७. प्र"नपत्र कोड–P04 – C08

प्रश्नपत्र नाम – जयशंकर प्रसाद

विद्यार्थी जयशंकर प्रसाद की रचनाओं का ेपढकर पारिवारिक एव ंसामाजिक जीवन में आने वाली प्रत्येक चुनौती का सामना करने में सक्षम होंगे। नाटकों के अध्ययन से रंगमंच को जानने समझने का अवसर मिलेगा तथा नाट्य कला के प्रति रूचि जाग्रत होगी।

Program Outcomes Program specific Outcomes and Corse Outcomes Of B.A. English Literature

Program Specific Outcomes: B.A. English Literature

PSO1: Comprehend various forms of literature like prose, poetry, drama and fiction.

PSO2: Apprehend different cultures and cultural sensibilities around the world.

PSO3: Develop the knowledge of grammatical system of English language.

PSO4: Define literary theory and terms in criticism.

PSO5: Write analytically in different formats like essays, reviews, research papers etc.

PSO6: Scope of employability and entrepreneurship in the field of Media and Journalism, Teaching, Public Relations, Human Resource, Civil Service, Creative Writing etc.

Course Outcomes: B.A. English Literature is an undergraduate three year program

B.A. English Literature 1st Year

Course: Paper I – Poetry

CO1: To learn what is poetry like, definition and kinds of poetry.

CO2: Analyze the various elements of poetry such as Diction, Tone, Form, Genres, Imagery, Figures of Speech, Symbolism, Theme, etc

CO3: To understand the history of English poetry like Chaucer to modern era etc.

CO4: Recognize the Rhythms, Metrics and other musical aspects of poetry and identify the variety of forms and genres of poetry such as Sonnets, Ballads, Dramatic Monologues, Free Verse, etc.

CO5: Understand the characteristics of different types of poetry like Epic poem Satire poem, Metaphysical poem, and Romantic poem.

Course: Paper II - Prose

CO1: To learn what is prose and know the important authors of the literature of prose.
CO2: Enlarge their active and passive vocabulary.
CO3: Enhance their understanding and increase pleasure towards reading.

CO4: Comprehends the literal and figurative use of language.

CO5: To understand the skill of argument.

B.A. English Literature 2nd Year

Course: Paper I – Drama

CO1: To learn what is drama and its types like, tragedy comedy etc.

CO2: To understand the age wise history of drama like, Elizabethan to till now.

CO3: Knows about the distinct literary characteristics of drama, emphasizing the changing approaches to theatre as well as the social, cultural, and philosophical implications in the plays.

CO4: Analyses play for their structure and meaning, using correct terminology.

CO5: Helps to develop the problem solving skill of life. B.A. English Literature 2nd Year Course:

Paper II – Fiction

CO1: To understand of the definition, role and age wise history of fiction.

CO2: It can develop the ability of imagination on the student's minds so they can draw the new world.

CO3: Its increases the pleasure of reading.

CO4: Fiction is a verbal machine which transports the readers in space and time.

CO5: Explores the entire range of human experience.

B.A. English Literature 3rd Year

Course: Paper I - Contemporary literature

CO1: To understand about the important writers of contemporary literature.

CO2: Understanding of literary works like novels, stories, poetry, drama, creative nonfiction.

CO3: To Learn about American poet and their poetry.

CO4: To learn about feminist writers and their writing style.

CO5: To understand difference between various varieties of genres of literature.

Course: Paper II - Indian Writing in English

CO1: Describe and differentiate the varieties of prose of major Indian writers.

CO2: Identify the various forms and types of poetry.

CO3: Specify the figurative language used in poems.

CO4: Analyze the use of myth in Indian writing in English.

CO5: To explain the issue or sub alternate and rationality in the literary domain.

Programme outcomes of MA English Literature

1- Reading – Students will become accomplished, active readers who appreciate ambiguity and complexity and who can articulate their own interpretation with an awareness and curiosity for other perspectives.

2- Writing skills and process- Students will be able to write effectively for a variety of professional and social settings they will practice writing as a process of motivated inquiry, engaging other writers ideas as they explore and develop their own.

3- Sense of earners – Students will develop an appreciation of how the formal elements of language and genre shape meaning, they will recognize hew writers can transgress or subvert generic expectation as will as fulfill them, and they will develop a facility at writing in appropriate genres for a variety of purposes and audiences.

4- Culture and History- Student will gain a knowledge of the major traditions English and an appreciation for the diversity of literacy and social voices within and some time marginalized by those tradition.They will develop an ability to read texts in relation to their historically rich contexts and traditions in order to gain a richer understanding of both text and context and to become more aware of themselves as situated historically and culturally.

5- Research Skills- Students will be able to identify the topics and formulate questions for productive way they will identify appropriate methods and sources for research and evaluate critically the sources they find and choose them effectively in their own writing citing the sources appropriately.

M.A. I & II Sem English Literature

Paper –I Poetry

1- The students would be provided information and knowledge of poetry and to develop the ability to read texts and to explicate texts written in a wide variety of forms, styles, structures and modes.

2- Demonstrate knowledge of literary terms, major literary genres, subgenres and periods and understanding of the historical development of literature writer in English form old English to the present.

3- To enable students to analyse different forms of poetry such as sonnets, epic, elegy, Dramatic monologues.

4- Jo enable students to critically appreciate poetry as a literary art and its various elements of poetry such as diction, tone, form, imagery, symbolism, figures of speech, theme etc.

5- This course would enable the students to study poetry from various aspects of cultures, languages and historic periods.

M.A. I & II Sem English Literature

Paper –II Drama

1- Boost up critical thinking and writing

2- Offer a platform to express Creativity and talent .

3- Ignite critical thinking and judge a work of art.4-Strengthen the aesthetic sense.

5-Develop global competence for successful life.

M.A. I & II Sem English Literature

Paper –IIIFiction

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

1- Describe and explain the various genres of novel picaresque realistic, historical, psychological, naturalism novel etc.

2- Analyze and interpret the texts in English.

3- Explain the movements and trends in fiction.

4- Present the knowledge of the text studied.

5- To learn human values and behavioral patterns from great woks of art, and develop the ability to understand human.

M.A. I & II Sem English Literature

Paper –IVProse

1- To understand the passage and grasp its meaning.

2- To read with correct pronunciation, stress, intonation, pause and articulation of voice.

3- To enable students to understand the passage by silent reading.

4- To enrich their active and passive vocabulary.

5- To express the ideas of the passage orally and in writing.

6- To enjoy reading and writing.

M.A. III& IV Sem English Literature

Paper –I Critical Theory

On completion of the course the student will be able to-

1- Debate the nature of literacy criticisms based on classical Greek paradigms.

2- Trace the historical development of criticisms.

3- Interpret literary work in the light of various critical approaches.

4- Compare and contrast major trends within literary theory and 20 th century.

Develop an aptitude for critical analysis of literary work.

M.A. III& IV Sem English Literature

Paper –IIEnglish language

The basic need of English language paper foundation course is-

1. To enhance the lingua skills such as LSRW, i.e. Listening, reading, writing and speaking.
2. To explore the Knowledge of literature through moral, ethical and literary texts.
3. To enable students to develop an awareness of linguistic- cultural richness of the world as an important outcome.
4. To promote students to develop an awareness of linguistic- cultural richness of the world as an important outcome.
5. To promote young learners in the international and global market with their communication skills.

M.A. III & IV Sem English Literature

Paper –III Indian writing in English (optional)

After completion of this course student will be able to-

1- How and why Indian literature emerged as a distinct field of study.

2- Trace the development of history of English literature from its beginning to the present day.

3-Interpret the works of great to writes of Indian writers in English.

4- Demonstrate through discussion and writing an understanding of significant culture and social issue presented in Indian English literature.

5- Awareness towards problem of interpreting Indian cultural via English language and acquaintance with the work of significant Indian writers After poetry, prose, fiction and drama.

M.A. III & IV Sem English Literature

Paper –IV American Literature

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

1- Acquire knowledge about the most important branch of English literature of the non British tradition.

2- Acquire a holistic understanding of the heterogeneity of American culture.

3- Gain an overview of influential American events during this period of history.

4- Understand the philosophy of the romantic writers.

5- Identify the philosophy of the Puritanism on some of the era's most promising writers.

B.A.. I year Paper I

भारत का इतिहास (प्रा. से 1200 ई.)

1- विद्यार्थियों को प्राचीन भारत के बारे में तथ्यपरक जानकारी देना।

2- इस पाठ्यक्रम प्रथम इकाई से विद्यार्थी को सबसे महत्वपूर्ण यह ज्ञात होगा कि वास्तव में इतिहास को पढ़ा क्यों जाता है और इतिहास का क्षेत्र कितना व्यापक है।

3- इस पाठ्यक्रम में इतिहास का एक महत्वपूर्ण खंड हड़प्पा सभ्यता है, जो भोश इतिहास से बिल्कुल अलग और अद्भूत है।

4- इस पाठ्यक्रम में वैदिक काल एवं बैदिध जैन धर्मो की जानकारी से भारत के धर्म एवं संस्कृति की महानता का ज्ञान होता है।

5- मौर्य – मार्योत्तर एवं गुप्त–गुप्तोत्तर काल के इतिहास जानने से भाासन–प्र''ाासन, सैन्थ, न्याय व राजनीतिक क्षेत्र की पर्याप्त जानकारी मिलती है।

B.A. I Year

द्वितीय प्रश्नपत्र

1- विश्व इतिहास के अध्ययन से विद्यार्थियो को ऐतिहासिक मानचि़त्रावली के साथ – साथ आधुनिक मानचित्रावली की जानकारी मिलती।

2- वै''िवक स्थापत्य कला की जानकारी मिलती है।

3- इस विशय में भारत के साथ वै''िवक सम्वयों का अध्ययन किया जाता है।

4- विश्व इतिहास से संबधित प्रतियोगी परीक्षा में पूछे जाने वाले प्रश्नपत्र में सहयोग प्रदान करता है।

5- ऐतिहासिक घटनाक्रम के अनुसार तिथि का ज्ञान प्राप्त होता है।

बी. ए. २ वर्ष

पेपर - १

1- इस पाठयक्रम विद्यार्थी को मध्यकालीन भारत की राजनीतिक सामाजिक धार्मिक व सांस्कृतिक द''ाा का ज्ञान होगा।

2- इस पाठयक्रम में अलाउदीन खिलजी, भोर''ाह सूरी अकबर जैसे भाासको की भाासन प्रणाली का ज्ञान होता है जिससे युगों तक प्र''ासकों के लिए प्रेरणादायी सिद्व हुई।

3- इस पाठ्यक्रम में अकबर को पढ़ने से विद्यार्थी को यह प्रेरणा मिलती है कि सहिश्णुता वह गुण है जिससे एक मुस्लिम भाासक ने लाखों की हिंदु जनता का दिल जीतकर उस पर सफलतापूर्वक ४६ वर्श भाासन किया।

4- इस पाठ्यक्रम में ि''ावाजी जैसे भाासकों को पढ़ने से राश्ट्रभक्ति और विपरीत परिस्थितियों में भी संघर्श करने की प्रेरणा विद्यार्थी को मिलती है।

5- इस पाठ्यक्रम में भक्तिसूफी अंदोलन पढ़ने से विद्यार्थी को हिंदु मुस्लिम दोनो की उदार छवि के द''ान के साथ आडम्बर विहीन भक्ति की प्रेरणा मिलती है।

M.A. History (I, II, III, IV Sem)

पेपर -१

बीसवी सदी का विश्व

१. विद्यार्थियों को २० वी सदी में विश्व की प्रमुख घटनाओं की जानकारी देना इसका प्रथम उददे''य है।

२. २० वी सदी में वै''िवक स्तर पर पूंजीवाद, समाजवाद, साम्राज्यवाद, उननिवं''ावाद जैसे सिद्धोता को समझाना।

३. ठस पाठ्यक्रम को पढ़ने से विद्यार्थी समस्त विश्व की घटनाओं का समग्रता में देख पाएंगे, जिससे उनका चिंतन स्तर बढ़ेगा।

४. इस पाठयक्रम में दोनों विश्व युद्वधों को विस्तार से पढ़ने समझने से विद्यार्थी को ऐसे युद्वधों की विभीशिका को समझने

का अवसर मिलेगा और उनके परिणामों को जानने से वैि"वक भोति का महत्व पता चलेगा।

५. वि"वयुदधों के बाद का विश्व जिनमें भीतयुद्वध न्छव् नाटो, वारसा आदि का अध्ययन विद्यार्थी को इतिहास से वर्तमान को जोड़कर समझने में अत्याधिक सहायक होगा।

M.A. History (I, II, III, IV Sem)

आधुनिक भारत का इतिहास

1- इस विशय को पढ़ने से विद्यार्थियों को पा"चात्य सभ्यता एवं संस्कृति का ज्ञान प्राप्त होता है।

2- इससे भारतीय स्वतंत्रता संघर्श की जानकारी मिलती है।

3- इस विशय के पढ़ने से प्रतियोगी परीक्षाओं में लाभ प्राप्त होता।

4- इसी विशय के हमें राश्ट्रीय/अंतराश्ट्रीय संग्रहालय की जानकारी मिलती है।

5- इतिहास के अध्ययन के द्वारा हमें जानकारी मिलती है किस प्रकार विदे"ाी ने भारत पर भाासन किया व कैसे भारतीय दासता के बंधन से मुक्त हुआ।

एम. ए. ३,४ सेमेस्टर

विशय - पर्यटन में ऐतिहासिक अनुप्रयोग

1- इस पाठ्यक्रम में विद्यार्थी को पर्यटन के लिये अधिक से अधिक पर्यटकों को आकर्शित करना।

2- पर्यटन स्थलों का ऐतिहासिक महत्व को बढाना।

3- विदे"ाी मुद्रा का अधिक अर्जित करने के उददे"य से और दे"ा की आर्थिक स्थिति को मजबूत करना।

4- पर्यटन एक उद्योग के रूप में विकसित करना तथा दे"ा की संस्कृति एवं सभ्यता को बनाये रखना।

5- पर्यटन के माध्यम से विद्यार्थियों को ि"ाक्षा देना तथा वर्तमान समय में बेरोजगारी की समस्या को कम करने।

संस्कृत विभाग

PSO १. प्राचीन एवं वैदिकसंहिताओं के अध्ययन से विद्यार्थियों में आध्यात्मिका का विकास, परोपकार की भावना, कर्त्तवयपरायणता, सदाचार जैसे श्रेश्ठ मानवीय गुण विकसित होगें।

PSO2. आदिकवि वाल्मीकि, वेदव्यास, भास, कालिदास आदिकवियों की कृतियों के अध्ययन से विद्यार्थियों में आद''ार्ा चरित्रनिर्माण तथा श्रेश्ठ मानवीय नैतिक मूल्यों में वृद्वि होगी।

PSO3 - भारतीय द''ान, 'ाोड''ा संस्कार के अध्ययन से विद्यार्थी जीवन के अंतिम सत्य को जानकर मुक्तिमार्ग के लिए प्रेरित होगें तथा 'ाोड''ा संस्कार के वैज्ञानिक पक्ष से परिचित होगें। संस्कृत गद्यरचना के अध्ययन से विद्यार्थियों में भाशा की दक्षता में वृद्वि होगी।

PSO4 . संस्कृत नाटकों के अध्ययन से विद्यार्थी भारतीय संस्कृति की पराकाश्ठा को समझकर अपनी सामाजिक मानवीय मूल्यों को समृद्व कर सकेगें।

PSO5 - आधुनिक संस्कृत साहित्य के अध्ययन से विद्यार्थीयों में नूतन काव्यरचना करने की कला विकसित होगी।

PSO6 - श्रीमद्भगवद्गीता, मनुस्मृति तथा कठोपनिशद् के अध्ययन से भारतीय आध्यात्मिक चिन्तन की परम्परा से परिचित होकर जीवन में सन्मार्ग की ओर चलने के लिए प्रेरित होकर श्रेश्ठ मानव समाज का निर्माण कर सकेगे।

संस्कृत विभाग

संस्कृत विभाग के पाठ्यक्रम में मूल्य आधारित पाठ्यक्रम के अनुसार ि''ाक्षण कार्य कराया जाता है।

बी. ए. प्रथम वर्श संस्कृत साहित्य के प्रथ म प्र''न पत्र में वैदिक संहिताओं के अंतर्गत जीवन मूल्य पर आधारित ऋग्वेद अग्निसूतक
यजुर्वेद ि''ावसहक्ल्पसूत तथा अथर्ववेद विजय सूक्त के ऋचाओं का अध्ययन व अध्ययपन कार्य कराया जाता है।

बी. ए. प्रथमवर्श संस्कृत साहित्य के द्वितीय प्र''न पत्र में मूल्यसंवर्धन हेतु आद''ार्ा चरित्र निर्माण एवम् मानवीय नैतिक मूल्य में अभिवृद्वि के निमित्त महर्शि वाल्मीकिकृत रामायण बालकाण्ड, महर्शिवेदव्यासविरचित महाभारत भाांतिपर्व, भारतीय

संस्कृति के पुरोधा महाकवि कालिदास का रघुवं ा महाकाव्य प्रथम सर्ग तथा आदिकविभास के स्वप्नवासवत्तम नाटक आदि अन्य कवियों की कृतियों का चयन व सक्लन कर ि"ाक्षण कार्य कराया जाता है।

बी. ए. द्वितीय वर्श संस्कृत साहित्य के प्रथम प्र"नपत्र में भारतीय द"र्ान अध्ययन से प्राप्त निश्कर्श के अनुसार जीवन के अन्तिम लक्ष्य को जानकर
मुक्तिमार्ग के लिए प्रेरित भारतीय जीवन पद्धति में 'ाोड"ा संस्कारों के महत्व विधान तथा वैज्ञानिक दृश्टिकोण से संस्कारो की आव"यकता वाणभट्ट के गघरचना के अन्तर्गत भ्ाुकनासोपदे"ा के अध्ययन के माध्यम से युवास्था बृद्धि कर जीवन धन्य करें।

बी. ए. द्वितीय वर्श संस्कृत साहित्य के द्वितीय प्र"न पत्र में भारतीय संस्कृति के उपासक प्रकृति के चतुरचतेरे नारीसौन्दर्य के पारखी अपनी कृतियों में त्याग तपस्या और तपोवन की त्रिवेणी प्रवाहित करने वाले महाकवि कालिदास कृत वि"वप्रसिद्ध अभिाान"ाकृन्तलम् नाटक भ्ाूद्रकरचित मृच्छकटिकम् नाटक में भ्ाूद्रक का यथार्थवादी सामाजिक दृश्टि तथा भवभूति के करूण रस स्थापना सिद्धि आदि अन्य संस्कृत कवियों की रचनाओं का चय कर ि"ाक्षण कार्य कराया जाता है।

बी. ए. तृतीय वर्श संस्कृत साहित्य के प्रथम प्र"न पत्र में महाकवि भारवि का अर्थगौरव व राजनीति संबंधी दृश्टि भवभूति का करूणरस प्रधान उत्तररातचरितम् नाटक दृश्टि भवभूति का करूणरस प्रधान उत्तररामचरितम् नाटक अप्पा"ाास्त्री रा"िावडेकर की राश्ट्रयता पण्डित
क्षमाराव का सर्वहारा के प्रति समाजवादी दूरी जानकीवल्लभ"ाास्त्री एवं श्रीनिवासरथ की आधुनिक संस्कृत गीत व कविताएं तथा संस्कृत महाकाव्य, गीतिकाव्य गघकाव्य कथासाहित्य व चम्पूकाव्य आदि में वर्णित नैतिक मानवीय मूल्यों का ि"ाक्षण कार्य कराया जाता है।

बी. ए. तृतीय वर्श संस्कृत साहित्य के द्वितीय प्र"न पत्र में मूल्य संवर्धन संरक्षण हेतु '' श्रीमद्भगवदगीता द्वितीय अध्याय मनुस्मृतिनवनीतम्'' तथा कठोपनिश्n का ि ाक्षण कार्य कराया जाता है।

GOVERNMENT AUTONOMOUS P. G. COLLEGE, CHHINDWARA (M.P.)

DEPARTMENT OF CHEMISTRY

B. Sc. {CHEMISTRY, BOTANY, ZOOLOGY}

B. Sc. {CHEMISTRY, BOTANY, MICROBIOLOGY}

B. SC.{CHEMISTRY, ZOOLOGY, BIOTECHNOLOGY}

Programme Specific Outcome: The student graduating with the Degree B.Sc Chemistry should be able to

PSO1. – To inculcate training and practical approach by using modern technology amongst the student. PSO2. – Such courses help to communicate effectively on commercials aspects with the society at large. PSO3. – Develop research oriented skills.

PSO4. – Understand good laboratory practices and safety.

PSO5. – Identify the area of internet in academic and research & development.

PSO6. – Gain the complete knowledge of practical and theory of

chemistry.COURSE OUTCOME

B. Sc. I YEAR

PAPER –I [PHYSICAL CHEMISTRY]

Students will be able to learn following topics:-

CO 1	A) Mathematical concepts of logarithm,straight line graphs,differentiation, Integration,factorial and probability. B) Gaseous states and molecular velocities –Critical phenomenon, Vander Waal's equation,root mean square,average and most probable velocities Maxwell's distribution of molecular velocities.
CO 2	A) Liquid state-intermolecular forces,liquid crystals classification and structure B) solid state-space lattice,laws of crystallography,radius ratio,lattice defects,bragg's law,structure of NaCl,ZnS and CsCl.
CO 3	Chemical kinetics- Rate of reaction and its determination,zero first second and pseudo order of reaction,Arrhenius equation,simple collision theory and T.S. Theory.
CO 4	Radioactivity and Nuclear chemistry, radioactivity, groupdisplacement law of soddy, radioactive disintegration nuclear fusion.
CO 5	A) Chemical equilibrium-law of mass action,lechatelier's principles fussion. B) Colloidal solutions –Classification, Hardy Schulz rule, Gold No. and application

PAPER –II [INORGANIC CHEMISTRY]

Students will be able to learn following topics:-

CO 1	Atomic structure: de Broglie equation, Heisenberg uncertainty principle, Schrodinger wave equation, Aufbau principle, Pauli's exclusion principle, Hund's rule of maximum multiplicity. Periodic properties: atomic and ionic radii, ionization enthalpy, electron affinity, electronegativity.
CO 2	Chemical bonding(Part I): covalent bond, Valence Bond Theory, VSEPR theory, Molecular Orbital Theory (Molecular geometry).
CO 3	Chemical bonding(Part II): Ionic solids- lattice energy, Born Haber cycle,solubility of ionic solids, Fajan's rule,Metallic bonds. Chemistry of noble gases : compounds of xenon.
	Weak interactions – H- bonding, Van der Waals forces.
CO 4	s-block elements: chemistry of group 1 and group 2 elements. p-block elements: chemistry of group 13 to group 17 elements.
CO 5	Diborane, higher boranes, borazine, fullerenes, silicates. Interhalogens, Tetrasulphur tetranitride.

PAPER –III[ORGANIC CHEMISTRY]

Students will be able to learn following topics:-

CO 1	Structure and bonding: hybridization, bond parameters, aromaticity, antiaromaticity, resonance, hyperconjugation, inductive, mesomeric,electromeric and steric effect. Mechanism of organic reactions
CO 2	Alkanes and cycloalkanes: nomenclature, classification, isomerism,methods of preparation, physical and chemical properties.
CO 3	Alkenes, cycloalkenes and dienes: nomenclature, methods of preparation, physical and chemical properties.
CO 4	Alkynes and alkyl halides: nomenclature, structure and bonding, methods of preparation, chemical reactions. Polyhalogen compounds: chloroform, carbon tetrachloride.

CO 5	Stereochemistry: optical isomerism, molecular chirality, enantiomers, diastereisomers,inversion, retention, racemisation, relative and absolute configuration, D&L and R&S system of nomenclature, geometrical isomerism, E&Z system of nomenclature.

B. Sc. II YEAR

PAPER –I [PHYSICAL CHEMISTRY]

Students will be able to learn following topics:-

CO 1	A) Thermodynamics –First law,second law of thermodynamics, Carnot cycle, Carnot theorem,entropy and spontaneity,Nernst heattheorem,Gibbs function(G), Helomholtz fuction(H) B) Thermochemistry- Standard enthalpy of formation,Hess's law of constant heat summation,enthalpy of neutralization
CO 2	Phase Equilibrium-Gibbs Phase rule,one component system-water,CO_2 and two component system-Bi-Cd,Pb-Ag Solid solution-Zn-Mg,NaCl-H_2O,$CuSO_4$-H_2O systems. Liquid-liquid mixtures – Raoult's and Henry's law, azeotropes. Phenol- water, trimethylamine- water, nicotine – water system. Steam distillation, Nernst distribution law.
CO 3	Electrochemistry : specific and equivalent conductivity, Kohlrausch law, Arrhenius theory, Ostwald's dilution law, DHO equation, transport number and its determination(Hittorf's method and Moving boundary method).
CO 4	Electrochemistry: Nernst equation, reversible electrodes, SHE, SEP, electrochemical series, concentration cells with or without transference, potentiometric titration, Buffers, Handerson- Hazel equation, hydrolysis of salts.
CO 5	Surface chemistry: adsorption, Freundlich's and Langmuir adsorption isotherm, surface area and its determination.

PAPER –II [INORGANIC CHEMISTRY]

Students will be able to learn following topics:-

CO 1	Chemistry of elements of first transition series. Coordination number and geometry of complexes.
CO 2	Chemistry of elements of second and third transition series.
CO 3	Co- ordination compounds: nomenclature and isomerism, Werner's Co-ordination theory, EAN, Valence Bond Theory of complexes. Oxidation and Reduction: Analysis of redox cycle, Frost, Latimer and Pourbaix diagrams.
CO 4	Chemistry of lanthanide elements. Chemistry of actinide elements.
CO 5	Acids and Bases: Arrhenius, Bronsted- lowry, lux-flood and Lewis concept. Non aqueous solvents: types and properties, reactions of liquid NH_3 and liquid SO_2.

PAPER –III [ORGANIC CHEMISTRY]

Students will be able to learn following topics:-

CO 1	EMS, Absorption spectra – UV spectroscopy, IR spectroscopy {interpretation of spectrum for structural elucidation}
CO 2	Alcohols: classification and nomenclature; Monohydric, Dihydric & Trihydric alcohols – methods of preparation and properties. Phenols: nomenclature, preparation and properties.
CO 3	Aldehydes and ketones: nomenclature, methods of preparation and properties.
CO 4	Carboxylic acids: nomenclature, methods of preparation and properties. Ethers: nomenclature, methods of preparation and properties.
CO 5	Nitroalkanes and Nitroarenes: preparation and chemical reactions. Amines: nomenclature, structure, methods of preparation and properties.

B. Sc. III YEAR

PAPER –I [PHYSICAL CHEMISTRY]

Students will be able to learn following topics:-

CO 1	Elementary quantum mechanics: Black body radiation, planck's radiation law, photoelectric effect, Heisenberg's uncertainty principle, Bohr's atomic model, Compton effect, de Broglie relation, Schrodinger's wave equation, particle in one dimensional box, LCAO, VBT, MOT.
CO 2	Spectroscopy: EMR, Born Oppenheimer Approximation, Rotational spectrum, Vibration spectrum.
CO 3	Raman spectrum, electronic spectrum and UV spectroscopy.
CO 4	Photochemistry: laws of photochemistry, Jablonski diagram, quantum yield, photosensitized reactions.
CO 5	Optical activity, dipole moment and magnetic properties: paramagnetism, diamagnetism and ferromagnetism.

PAPER –II[INORGANIC CHEMISTRY]

Students will be able to learn following topics:-

CO 1	HSAB Principle: application and limitation. Silicones and Phosphazines: methods of preparation,properties and application/ uses.
CO 2	Metal ligand bonding in transition metal complexes: CFT, CFS, CFSE, application and limitation of CFT. Thermodynamic stability of complexes, substitution reactions in square planar complexes.
CO 3	Magnetic properties of transition metal complexes: diamagnetism, paramagnetism, ferromagnetism, antiferromagnetism and ferrimagnetism. Magnetic susceptibility and its determination. Magnetic moment, L-S coupling, determination of ground state term symbol.
CO 4	Electronic spectra of transition metal complexes: electronic transitions, selection rules for d-d transitions, spectroscopic ground states. Orgel energy level diagram. Organometallic chemistry.
CO 5	Bio-inorganic chemistry: Haemoglobin, Myoglobin, Nitrogen fixation. Metal nitrosyl complex.

PAPER –III[ORGANIC CHEMISTRY]

Students will be able to learn following topics:-

CO 1	Spectroscopy: H^1 NMR spectroscopy- chemical shift, spin-spin coupling and coupling constant. Application of UV, IR & PMR spectroscopy for organic compounds.
CO 2	Organometallic compounds: organomagnesium, organozinc and organolithium compounds – preparation and chemical reactions. Organosulphur compounds: nomenclature and properties. Organic synthesis by enolates.
CO 3	Carbohydrates:classification and nomenclature. Monosaccharide – configuration, determination of size of the ring, mutarotation, structure of D(+) glucose. Disaccharide: maltose, sucrose, lactose (excluding structure)

	Polysaccharide: starch, cellulose (excluding structure) Fats, oils and detergents.
CO 4	Amino acids: classification, structure and stereochemistry. Isoelectric point, electrophoresis, structure of proteins. Nucleic acids: DNA & RNA Synthetic dyes
CO 5	Heterocyclic compounds: pyrrole, furan, thiophene, pyridine, indole, quinoline, isoquinoline- preparation and chemical properties.

GOVERNMENT AUTONOMOUS P. G. COLLEGE, CHHINDWARA (M.P.)

DEPARTMENT OF CHEMISTRY

PROGRAM OUTCOME

M. Sc. CHEMISTRY

- To impart training in chemistry at advanced level in a more holistic way and help the student for subject learning.
- To train the students to make confident and capable of accepting any challenge in chemistry.
- To give a flavor of research in chemistry and guide the students for research career.
- To make the student aware the impact of chemistry on environment and imbibe the concept of sustainable developments.
- To abreast the student about the current status and new development in chemistry.
- To educate the students with respect to skills and knowledge to practice chemistry in ways that is benign to health and environment.
- To provide flexibility in selecting the courses as per interest and also to provide space for fast learners**.**

COURSE OUTCOME

M. Sc. CHEMISTRY Semester I

PAPER –I INORGANIC CHEMISTRY

CO 1	Stereochemistry and bonding in main group compound: VSEPR, Walsh diagram(triatomic and penta-atomic molecules),dΠ-pΠ bond, bent

	rule and energetic of hybridization.
CO 2	Metal ligand equilibrium in solution – Stepwise and overall formation constants, factors affecting stability of metal complexes, chelate effect.
CO 3	Reaction mechanism of transition metal complexes- Energy profile of a reaction ,substitution reaction in square planner complexes, trans effect, redox reaction, electron transfer reaction, cross reaction and Marcus Hush theory.
CO 4	Metal ligand bonding – Limitation of crystal field theory, molecular orbital theory.
CO 5	HSAB principle, E and C equation, metallurgy, ferrocine complexes.

PAPER –II ORGANIC CHEMISTRY

CO 1	Student gain knowledge of general organic chemistry and different effects.
CO 2	Learners gain knowledge of stereochemistry and its application
CO 3	Learners gain the knowledge of carbocation, carbanion and free radical and conformation of sugar.
CO 4	Student gain knowledge of reaction mechanism through the kinetic and thermodynamic approach.
CO 5	Student gain the knowledge about the aliphatic nucleophilic substitution reaction.

PAPER –III Physical chemistry

CO 1	Schrodinger equation – Probability density of the electron calculated from the wave function show multiple orbital with unique energy and distribution in space.
CO 2	The variation theorem- The variation theorem is the most powerful technique for doing working approximates when the much of the discussion that follows will focus the relative merits of these basis sets.

CO 3	Angular momentum- Angular momentum give spherical density distributions and in addition place charge density at the position of the nucleus.
CO 4	Classical thermodynamics – This is the description of the states of thermodynamic system at near equilibrium that uses macroscopic measurable.
CO 5	Femidirac statistics – Describe the absolute temperature is the energy of the single particle state 'I' and 'u' is the total chemical potential.

PAPER –IV GROUP THEORY AND SPECTROSCOPY

CO 1	Symmetry elements and symmetry operation,point group, great orthogonality theorem.
CO 2	Rigid rotor model,effect of isotopic substitution of the transition frequency,non rigid rotor.
CO 3	Infra red spectroscopy,Harmonic Oscillator,Zero point energy,Anhormonicity,Most probable potential diagram,overtone and hot bands.
CO 4	Classical and Quantum theory of Raman effect,pure rotational vibration Raman spectra, resonance raman spectroscopy.
CO 5	Energy level molecular orbitals,vibronic transition.frank condon's principle,spectra of transition metal complexes. Photoelectric effect ,koopmans's theorem.characterization of nano particals.

PAPER – V Mathematics for Chemists

CO 1	Vector- Student will understand the concept of vector and be able to perform basic vector operations (addition, substitution &scalar multiplication).student will be able to draw vectors on the coordinate plane and graphically add substrate and multiply by scalar.
CO 2	Differential calculus- In mathematics differential calculus is used to find the rate of change of quantity with respect to other in case of finding a function is increasing or decreasing function in a graph. To find the maximum and the minimum value of curve.
CO 3	Integral calculus-

	To understand the process of anti differentiation. To recognize the problem of calculating areas bounded by non linear functions. To apply knowledge and skill relating to anti differentiation to solve problems. To use mathematical language both written and spoken to communicate understanding effectively.
CO 4	Elementary differential equation- This course is intended to expose you to the basic ideas of differential equations. Combined with some ideas from linear algebra solving differential equations using numerical method.
CO 5	Permutation and probability – Students will be able to correctly choose when to use permutations and combinations in order to determine the probability of compound events and to calculate permutations and combinations to then find the probability of a compound events or to solve problem.

OR

PAPER – V Biology for Chemists

CO 1	Cell structure and function- Compare and contrast prokaryotic and eukaryotic cells list their similarities and differences. Learn the structure and function of each of the following and where applicable relate to specific know genetic diseases. Plasma membrane, cytoskeleton, nucleus, endoplasmic reticulum lysosomes.
CO 2	Carbohydrates Define carbohydrates,explain the difference between simple and complex carbohydrates, discussed the benefits of simple carbohydrates and disadvantages of complex carbohydrates and disadvantages of complexes carbohydrates.
CO 3	Lipid –

	Define lipids, identify the chemicals the body uses to digest lipids,explain the process of lipid digestion and absorption
CO 4	Amino acids, peptides and proteins- Define amino acids; explain the structure of amino acids, list types of amino acid, described how a peptide bond forms,define a protein and differentiate between the four levels of structure of protein.
CO 5	Nucleic acids Define nucleic acids ,discussed the structure and types of nucleic acid DNA and RNA, explain the biological importance of nuceic acid,describe gross structure of nucleotide.

M. Sc. CHEMISTRY Semester II

PAPER –I INORGANIC CHEMISTRY

CO 1	Student gain the knowledge of electronic spectra, spectroscopic terms and or gel diagram, Tanabe-Sugano diagram for d1 -d 10 system.
CO 2	Gain the knowledge of spin and orbital contribution, magnetize properties of transition metal.
CO 3	Gain the knowledge of metal carbonyl and its structure nitrosyl, No, Di oxygen complex studies.
CO 4	Student gain the knowledge about coordination compound.
CO 5	Student gain the knowledge about ORD, CD and different effect as cotton effect, Kerr effect

PAPER –II ORGANIC CHEMISTRY

CO 1	Students learnt about various concept of aromatic electrophonic substitution Reaction as, ortho para ratio, Diazonium coupling vilsmeir reaction, SN1AR.
CO 2	Learners learnt about the free radical reaction, rearrangement and reactivity.
CO 3	Student gain the knowledge of addition reaction region and chemo-selectivity
CO 4	Student gain the knowledge many name reactions and its mechanism. Elimination

	concept.
CO 5	Student gain the knowledge of all per cyclic reaction. FMO through and classification of pericyclic reaction.

PAPER –III Physical Chemistry

CO 1	Chemical dynamics – New chemistry and unexpected chemical behavior can be discovered in essence cold temperatures allow us to manipulate many of the methods.
CO 2	Surface chemistry Benefits of surface chemistry modification with plasma treatment .surface can be modified by attachment or adsorption of functional groups introduced by the plasma gas.
CO 3	Macromolecules Under section 6602(b) at the pollution prevention act(PPA) of the act contains no language to suggest that molecular design of a target substance was ever considered but the notion of chemical design lurks in several places for example reformulation or redesign of products.
CO 4	Entropy- it is a scientific concept as well as a measurable physical property that is it has found for raging application in chemistry and physics biological systems and their relation to life.
CO 5	Electrochemistry- it offers a very mild and atom efficient method to achieve selective oxidative or reductive transformations using electron as reactants. It therefore avoids the use of other harsh and often toxic chemical reducing and oxidizing agents.

PAPER –IV SPECTROSCOPY AND DIFFRACTION METHODS

CO 1	Nuclear spin, shielding of magnetic nuclei, chemical shift, deshielding ,spin decoupling, basic ideas about instruments.
CO 2	Quadrupole nuclei, electric field gradient, coupling constants, applications.
CO 3	Zero field splitting ,Kramer's degeneracy, factors affecting "g"value,measurement techniques.
CO 4	Bragg condition, millar indixes, laue method, Debye Scherrer method, identification of unit cells from systematic absence in diffraction pattern.
CO 5	Scattering intensity Vs scattering angles, wierl equation, Neutron diffraction

	scattering of neutrons by solid, measurement technique.

PAPER –V Computer for chemists

CO 1	Introduction to computers and computing upon successful completion of major in computer and information science students will be able to demonstrate proficiency in problem solving techniques using computer. Show an awareness of what the major computer components are and now they act as system. To provides opportunity for the study of modern method of information processing and its application.
CO 2	Computer programming in FORTRAN/BASIC understand FORTRAN is a computer programming language that is extensively used in numerical scientific computing.
CO 3	Programming in chemistry- Programming language form the basis of working with molecular structure on a computer data structure to represent a chemical structure and algorithms to manipulate them are implemented in a programming language.
CO 4	Use of computer programs- Computer programming is a set of instructions to facilitate specific action. computer programmers create instructions for a computer to execute by writing and testing code that enables applications and software programs to operate successfully
CO 5	Internet - Internet the most useful technology of modern times which help us not only in our daily lives but also in professional lives for educational purpose it is widely used to gather information and to do research or add to the knowledge of various subjects. Internet plays a very vital role in education.

M. Sc. CHEMISTRY Semester III

PAPER –I Spectroscopy

CO 1	Electronic spectral studies for d^1 to d^9 system in octahedral. Tetrahedral and square planner complexes.
CO 2	Symmetry and shape of AB2, AB3, AB4, AB5, and AB6 type of molecule. Application of Resonance Raman spectroscopy and its application.
CO 3	Nuclear magnetic Resonance Spectroscopy ,chemical shift, spin-spin interaction.
CO 4	Chemical exchange, effect of deuteration, hinderd rotation, NMR shift Reagent.

CO 5	Mossbauer spectroscopy ,basic principle, spectral parameter, structure and detection of oxidation state inequivalent MB atoms.

PAPER –II (Photochemistry)

CO 1	Interaction of electromagnetic radiation with matter- It is necessary to understand what electromagnetic radiation is show wave nature as well as particle nature.
CO 2	Determination of reaction mechanism- Used for organic reaction mechanism determination like product identification isotope tracking of intermediate and study stereochemistry and kinetics.
CO 3	Electrocyclic reaction- The photochemistry of alkenes attracts a great deal of attention and it starts a new era in organic synthesis electronically excited olefinic bond gives a number of reactions.
CO 4	Photochemistry of carbonyl compounds- The reactivity of an excited state carbonyl compounds depends upon the multiplicity of the excited state and upon the electronic configuration of the excited state.
CO 5	Photochemistry of vision- The most precious gift given by god is vision. Scientifically "eye" is a bio- organic instrument which is able to convert radiation energy [visible region of electromagnetic radiation]

PAPER –III Environmental Chemistry

CO 1	Atmospheric layers, vertical temperature profile, heat budget of the earth, lapse rate, temperature inversion, global mean temperature of the atmosphere, pressure variation and scale height, biogeochemical cycles, tropospheric photochemistry.
CO 2	Air pollution, climate and health, acid rain, stratospheric ozone depletion, green house effect, urban air pollution.
CO 3	Aquatic chemistry and water pollution ,determination of DO,COD and BOD, purification of drinking water, treatment of waste and sewage
CO 4	Environmental toxicology, toxic heavy metal, toxic organic compound, polychlorinated biphenyls, polynuclear aromatic hydrocarbons.
CO 5	Soil and environmental disasters, industrial pollution and chemical toxicology.

PAPER –IV Analytical Chemistry

CO 1	Statistical analysis – Significant figures, accuracy of precision, errors, standard deviation, significance test, sample preparation for chromatography.
CO 2	Chromatography- Theory of chromatography, gas chromatography instrumentation, high performance liquid chromatography instrumentation, capillary electrophoresis instrumentation.
CO 3	Ion exchange- Types of ion exchangers, ion exchange chromatography, solvent extraction ,factors affecting it, extraction reagent, synergetic effect, extraction by crown ethers
CO 4	Atomic absorption spectrometry- Principle, Instrumentation. Electrolytic methods-voltammetry polorography, differential pulse polarography, cyclic voltammetry, anodic shipping analysis.
CO 5	Acid base titrations- kjeldahl method, precipitation titrations, complexometric titratios ,redox titration, determination of DO,BOD and COD.

M. Sc. CHEMISTRY Semester IV

PAPER – I

CO 1	Ultra violet and Visible spectroscopy, Beer –Lambert law, Effect of solvent on electronic transition, Fieser Woodward rule.
CO 2	Infrared Spectroscopy, Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compound ,alcohols ethers.
CO 3	Nuclear Magnetic Resonance of Paramagnetic substances in solution, The contact and Pseudo contact shifts.
CO 4	Carbon- 13 NMR Spectroscopy, General consideration, chemical shift, coupling constants.
CO 5	Mass spectrometry, introduction ion production E1,C1, ESI and FAB, Me Lafferty rearrangement, nitrogen rule.

PAPER –II Solid state chemistry

CO 1	Solid state reaction- Probably the most widely used method for the preparation of polycrystalline solids (Powders)is the direct reaction in the solid state of a mixture of solid starting material.
CO 2	Crystal defects and non stoichiometry-defect can be broadly divided into two groups stoichiometric defects in which the crystal composition is unchanged on introduction the defects and non stoichiometric defects which area consequence of a change in crystal composition.
CO 3	Magnetic properties- These are usually located on metal cations magnetic behavior is thus restricted mainly to compounds of transition metals and lanthanides many of which passes unpaired d and f electrons respectively several magnetic effects are possible
CO 4	Organic charge transfer complex new superconductors- These has been much interest for several years in two component is a pi electron donor and the other an electron acceptor the tantalizing possibility of achieving superconductivity at a higher temperature provides added impetus to research on related new materials.
CO 5	Nanomaterials –nanotechnology is a field of research and innovation concerned with building things generally materials and divides on the scale of atoms and molecules a nanometer is one billionth of a meter ten times the diameter of a hydrogen atom, nanomaterials research takes a materials science based approach to nanotechnology.

PAPER –III BIOCHEMISTRY

CO 1	Metal Ions in biological systems, bulk and trace metals with special reference to Na,K,Mg ,Ca, Fe, Cu, Zn,Co, and K^+ /Na^+ pump.
CO 2	Bioenergetics and ATPcycle, DNA polymerization,photosystem Iand photosystem II .
CO 3	Transport and storage of Dioxygen, haemoglobin mygolobin,
CO 4	Electron Transfer in biology,structure and function of metal of proteins in electron transport processes cytochromes.
CO 5	Nitrogen Fixation, nitrogenase, chemical nitrogen fixation.

PAPER –V MEDICINAL CHEMISTRY

CO 1	SAR ,receptor site theory, drug design, QSAR, Free Wilson analysis ,Hansh analysis.
CO 2	Pharmacodynamics- Enzyme stimulation, enzyme inhibition, sulfonamides, drug metabolism, xenobiotics.
CO 3	Antibiotics and antibacterial- Penicillins,Cephelosporins,Streptomycins,Tetracyclinies,Dectinomycins.
CO 4	Antifungal –polyenes,Antibacterial-ciprofloxacin,norfloxacin,Antiviral-acyclovir,Antimalarials-chloroquine,chloroguanide and mefloquine.
CO 5	Non -steroidal anti-inflammatory drugs-diclofenac sodium, ibuprofen, nefopam. Antihistaminic agents-terfenadine, cinnarizine, salbutamol, beclomethasone dipropionate.

PROGRAMME OUTCOMES: Computer Application

After successful completion of B.Sc. Computer Course student will be able to:

PSO 1 Understand the depth knowledge of various subjects of Computer.

PSO2. Gain the knowledge of Computer through theory and practical's.

PSO3. Demonstrate skills and competencies to conduct wide range of Computer experiments.

PSO4 Understand good laboratory practices and safety.

PSO5. Identify their area of interest in academic and Research & Development.

PSO6. Develop research oriented skills.

PSO.7 Perform job in various fields such as engineering, education, banking, business and public service, etc. with precision, analytical mind, innovative thinking, clarity of thought and expression, systematic approach.

Mathematics department

Programme outcome, programme specific outcomes and course outcomes
Programme specific outcomes

Po1 critical thinking to carry out scientific investigtion objectively without being biased with preconcieved notions. Po2. Equip the student with skills to analyze problems ,
Formulate a hypothesis, evaluate and validate results and draw reasonable conclusions.
Po3 encourage the students to develop a range of generic skills helpful in employement, internship and social activities.
Po4 able to solve mathematical problem by usingmodern technology.
Po5 demonstrate proficiency in writing proofs.

B.sc. I year

Algebraand trigonometry
L1: student understand basic knowledge of matrics, rank and nutillity of matrics.

L2:student understand normal form and echelon form.

L3: student understand eigen values and eigen vectors.

L4: linear independence and dependance of vectors.

L5: solving simultaneous linear equation.

Calculus and differential equation

L1: successive differentiation, maclaurin and taylor series expansion.

L2: curve tracing,curvature .

L3: linear differential equations , geometrical meaning of differential equations.

L4: orthogonal trajectories,linear differential equations with constant coefficient .

L5: homogeneous differential equation,method of seperation of variables.

Vector analysis and geometry

L1:student understand gradient, divergence and curl.

L2: student understand vector integrationngauss and stokes theorem.

L3: student understand general system of conics.

L4: student understand equation of cone with given base, right circular cone.

L5: student understand central conicoids, paraboloids.

B.sc. II year

Algebra

L1: student understood the concept and basic properties of groups and subgroups.

L2: student understood coset decomposition,normal subgroups and quotient groups.

L3: student gained knowledge of homomorphism and isomorphism of groups and permutation groups.

L4: student understood group automorphism and inner automorphism.

L5: student understood ring , subring, ideals , quotient ring etc.

Advanced calculus

L1: student understood concept and properties of sequence , cauchy sequence and series and various tests of convergence of series.

L2: student understood concept of continuity and differentiability of a function of one variable.

L3: student understood concept of continuity and differentiability of function of two variable.

L4: student understood concept of envelope,evolute,maxima and minima of function of two variables, beta and gamma function.

L5: student understood concept of double and triple integrals with their application.

Differential equation

L1: student understood series solution of differential equations. L2 : student understood

laplace transform

L3: student understood inverse laplace transform.

L4: student understood partial differential equation

L5: student understood partial differntial equation of higher order.

B.Sc. III year

Linear algebra and numerical analysis

L1: student understood vector space and subspaces,dimension and quotient space.

L2: student understood representation of linear transformation in matrix form

L3: student understood inner product space. L4: solution of

equations,interpolation.

L5: solution of simultaneous linear equation using gauss elimination ,lu etc.

Real and complex analysis

L1: student understood reimann integration and their properties. L2: student understood improper integrals and their convergence.

L3: student understood concept of metric space with properties.

L4: student understood continuity and differentiability of complex functions.

L5: student understood power series.

Discrete mathematics:

L1: student understood boolean function and relation with their properties.

L2: student understood concept of lattices and their fundamental properties.

L3: student understood concept of graph ,path and circuits. L4: student understood

concept of trees and their properties.

L5: student understood concept of matrix representation of graphs.

Learning outcomes of post graduate classes. Programme outcomes

Pso1 understanding of the fundamental axioms in mathematics and capability of developing ideas based on them.

Pso2. Inculcate mathematical rasoning.

Pso3.prepare and motivate students for research studies in mathematics and related field.

Pso4. Provide knowledge of a wide range of mathematical techniques and application of mathematical methods/ tools in other scientific and engineering domains.

Pso5. Provide advanced knowledge on topics in pure mathematics, empowering the students to pirsue higher degrees at reputed academic institutions.

Pso7. Nurture problem solving skills, thinking, creativity through assignments, project work.

Pso8. Assist sudents in preparing for competitive exams e.g. net, Gate etc.

Pso9. Demonstrate engagement with current research and developments in the subject.

Pso10. Select, interpret and critically evaluate information from a range of sources that include books, scientific reports, journals, case studies and the internet.

Advanced abstract algebra

L1: student understood normal and subnormal series of groups, solvable and nilpotent groups.

L2: student understood field extension and its types. L3: student understood

automorphism of groups.

L4: student understood modules and submodules, noetherian and artinian ring.

L5: student understood linear transformation.

mathematical real analysis and lebesgue integral

L1: student understood riemann –steilje integral and its properties.

L2: student understood sequence and series of functions.,functions of several variables,jacobians,differentiation of integrals.

L3: student understood lebesgue outer measure.

L4: student understood function of bounded variation and l^p Spaces.

L5: student understood dual spaces .

Topology

L1: student understood cardinality and countability.

L2: student understood topological spaces, relative topology, bases and subbases.

L3: student understood alternate methods of defining topology ,countable spaces and seperable spaces and seperable axioms.

L4: : student understood path connectedness,connected spaces, connectedness and compactness in topological space.

L5: : student understood tychonoff product topology and product space.

L6: : student understood embedding and metrization,net filters and ultra filters,fundamental group and covering spaces,homotopy of paths.

Complex analysis

L1: : student understoodcomplex integration and related theorems.

L2: : student understood calculus of residues,poles,singularities. L3: : student understood mobius transformation.

L4: : student understood cr equation and conformfal mapping

L5: : student understood harnack`s inequality and hadmards principle and little picard principle.

Advanced discrete mathematics

L1: : student understood semi groups, monoids ,lattices

L2: : student understood boolean algebra and graph theory. L3:: student understood graphs and trees.

L4: : student understood finite state machines.

L5: : student understood languages and grammars.

Functional analysis

L1: : student understood inner product spaces

L2: : student understoodquotient spaces and linear operators. L3: : student understoodlinear functionals,dual spaces.

L4: : student understood hahn banach theorem for different spaces, orthonormal sets.

L5: : student understood projection mapping,operators. Advanced functional analysis

L1: : student understood differentiation in normed spaces.

L2: : student understood fixed point theorem, banach contraction principle –with applications
L3: : student understood topological vector spaces,product and quotient spaces in topological vector spaces.

L4: : student understoodfinite dimensional topological vector spaces, locally convex topological vector spaces, normability,metrizability and completeness of topological vector spaces.
L5: : student understood frechett space,uniform boundedness principle .

L6: : student understood variational inequalities ,physical phenomenon represented by variational inequalities.

Mechanics

L1: : student understood constraints and its kinds, generalized coordinates.
L2: : student understood lagrange`s equation of motion of first kind and second kind.

L3: : student understood hamilton`s variables and related theorems.

L4: : student understood concept of calculus of variation . L5: : student understood attraction and potential.

Integral transform

L1: : student understood application of laplace transform in solving differential equation

L2: : student understood laplace equation and its applications.

L3: : student understood heat and wave equation and its applications.

L4: : student understood fourier transform.

L5: : student understood parsevell`s identity, convolution theorem.

Spherical trigonometry and astronomy

L1: : student understood fundamental definations

L2: : student understood fundamental formulaes for spherical triangle, right angled triangles and properties.

L3: : student understood spherical axis and related theorems

L4: : student understood celestial sphere and related definations.

L5: : student understood astronomical refraction,time and planetary phenomen

Department of zoology

Programme Specific Outcomes and Course Outcomes of B.Sc. in Zoology Programme

Programme Specific Outcomes

PO1:*Knowledge and understanding:* Gain knowledge and understanding of:

1) The complex interactions among various living organisms or animals of different phyla, their distribution and their relationship with the environment.

2) Physiological process in animal at their molecular level

3) knowledge of protection of vulnerable and endangered species.

PO2*Awareness:*- Awareness about environment and its conservation processes, pollution control and its importance.

PO3 *Skill Development*: Student can enhance their skill in various field of Zoology such as sericulture, pisciculture, agriculture and apiculture.

PO4*Specific Intellectual and Practical Skills*:Understand how organisms are classified and identified, Learn basic laboratory and analytical skills, Demonstrate competence in handling and statistical analysis of data gained from practical , Learn communication and IT skills.

PO5:*Lifelong learners*: Capable of self-paced and self-directed learning aimed at personal development and for improving knowledge.

PO6*Critical thinker and problem solver*: Ability to have critical thinking and efficient problem solving skills in the basic areas of Zoology (animal diversity, principles of ecology, comparative anatomy and developmental biology of vertebrates, physiology and biochemistry, genetics and evolutionary biology, animal biotechnology, applied Zoology).

PO7: Scientific aptitude :Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of the works. Ex. Students will be able to identify the major groups of organisms and be able to classify them within a phylogenetic framework. They will able to compare and contrast the characteristics of different phylum such as protozoa, porifera, coelenterate etc.

Course Outcomes:

B.Sc. Zoology First Year

Course: Paper I- Invertebrate

CO 1 Classify and describe the general characters of invertebrates.

CO 2 Understand the origin and evolutionary of different phylum from protozoa to hemichordate.
CO 3 Understand the nature, diversity, level of organisation and affinity among the organism.
CO 4 Explain the larval forms of various phylum.

CO 5 Gain knowledge about type study of plasmodium, sycon, obelia, liver fluke, palaemon, pila, starfish etc.

Course: Paper II -Cell biology and developmental biology

C0 1 Understood the importance of cell andcell organelles.

CO2 Understood the structure and functions of chromosomes, mitotic cell division, meiotic cell division and their significance.

CO3 Explain Gametogenesis, Fertilization, Parthenogenesis, Regeneration.
CO4 Development of Frog and chick embryology.
CO5 Differentiate between prokaryotes and eukaryotes.

Practical Work: Learning Outcomes

- Understand the anatomy of invertebrate through videos.
- Identification of slides and museum specimen by morphological characters.
- Learn slide preparation of mitosis division in onion root tip.

B.Sc. Zoology Second Year

Course: Paper I -Vertebrate and Evolution

CO 1 Understand classification, origin and affinity among Phylum Chordata.

CO2 Understand comparative anatomy of Integument, Limbs and girdles, Digestive system and Respiratory,aortic arches, Heart, brain and urinogenital system etc in vertebrates.

CO3- Understand the theories , types and evidences of evolution.

CO4 Gain knowledge of fossil, fossilization and determination of age of fossils
CO5 Describe the origin of life and evolution of man.

Course: Paper II -Animal physiology and Biochemistry

CO1 Seeks to understand the mechanism which keeps the body alive and functioning.
CO2 Basic knowledge of biomolecules and their metabolism.
CO3 Understand the physiology of digestion. Respiration, excretion and immune system in physiology.

CO4 Understand the structure and function of endocrine gland
CO5 Explain the mechanism of neuromuscular coordination.
Practical work: Learning Outcomes

- Understand anatomy of local fish morphology by computer simulation techniques.
- Identification of museum specimen of vertebrates by external features.
- Understand the evolutionary importance of living fossils
- Learn counting of RBC, Haemoglobin percentage.

B.Sc. Zoology third Year

Course: Paper I -Genetics

CO1 Comprehensive, detailed understanding of the chemical basis of heredity.
CO2 Understanding of genetic methodology .
CO3 Understanding of how population provides insight into cellular and molecular mechanism.

CO4 Understanding the role of genetic technologies in industries related to biotechnology and other fields.

CO5 Understanding how genetic concepts affect broad societal issues including health and disease, food and natural resource etc.

Course: Paper IIEcology and Applied Zoology

CO1Understand how earth's major ecosystem functions.

CO2 Understand the value of ecosystem for human, animals and plants.

C03 Understand the impact on ecosystem due to human activity and necessity of awareness for ecosystem.

C04 Information and skill of applied zoology including sericulture, lac culture, and apiculture
CO5 Important factors for performing a sustainable fisheries and aquaculture.

Practical work: Learning Outcome

- Identification of various animals based on morphological features.
- Understand the procedures of water analysis.
- Awareness of importance of wildlife and their conservation.
- Learner gain knowledge about instrumentation

Programme outcomes and course outcomes of M.Sc. in Zoology programme

Programme Outcomes

PO1 Knowledge and understanding: (1) Knows the concept, process, physiology and molecular basis of animal development.

(2) Knows about different biological systems, their coordination and control as well as evolution, behaviour and biological roles of the animals in ecosystem.

(3) Understand the application of biopesticides, knows about source, method and production of biofuel.

PO2 *Scientific temper:* Project work helps to develop scientific temper in the student. They will able to access primary literature, identify relevant work for a particular topic and evaluate the scientific content of these works.

PO3 Job Opportunity: students can join as scientist or assistant professor and even can look for professional job oriented courses ,such as Indian civil services, Indian forest services, Indian police services etc.

*PO4 Skill development:*1) Practical and theoretical skills gained in this programme will be helpful in designing different public health strategies for social welfare.

2) Able to analyse qualitative and quantitative evolutionary parameters using various modern bioinformatics and computational tools used in modern science.

PO5Self employability: students know about the economically important fisheries, poultry, animal husbandry, methods of preparation and application of milk and milk products.

PO6 *Communication skill:*Communication: Communicate effectively on complex activity, write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

*PO6 Problem solving and critical thinking:a*bility to have problem solving and critical thinking in various area of zoology(biochemistry, cell biology, immunology, tools and techniques, biostatistics etc)

PO7 Individual and team work: Function effectively as an individual, and as a member or leader in diverse team.

COURSE OUTCOMES

M.Sc. First semester

Course: Paper I Biosystematics,taxonomy and evolution

CO1 imparts knowledge regarding the various theory of evolution, evolutionary process such as variation, speciation, natural selection and origin of horse.

CO2 explain principles, method and history of biological classification.

CO3 Compare the methods of collection and preservation of animals such as insects, zooplankton, benthos etc.

CO4Identify animals with the help of taxonomic keys.

CO5 Describe international code of zoological nomenclature and use scientific name correctly.

Course :Paper II Structure and function of invertebrate

CO1 Describe basis of classification

CO2 Describe different physiological body processes of invertebrate

CO3 Describe larval forms of invertebrates

CO4 Describe characteristics and significance of minor phyla

CO5 Describe life history of the non-coelomate and coelomate minor phyla.

Course : Paper III Quantitative biology , Biodiversity and wildlife

CO1 Demonstrate quantitative numeracy and facility with the language of mathematics.

CO2 Make statistical inferences from data sets.

CO3 understand the value of biodiversity and wildlife to human

CO understand human impacts on biodiversity ,wildlife and ecosystems and conservation of natural resources.

Co5 learnbest data analysis methods for their research project.

Course : Paper IV Biomolecules and structural Biology

CO1 explain the basis of biological macromolecules constitution and traits

CO2 explain the basis of biological catalysis

CO3 explain control mechanisms of important biological processes: cell signalling, transcription, translation, and protein secretion

CO4 Analyse nucleotide structure.

CO5 Compare and contrast RNA and DNA structure.

CO6 Explain key functions of RNA and DNA. 4. Understand the flow of genetic information.

CO7 Explain basic concepts of metabolism.CO1 explain the basis of biological macromolecules constitution and traits.

M.sc Second Semester

Course :Paper I General and comparative vertebrate physiology and endocrinology

CO1 Imparts knowledge about various metabolic and physiological mechanisms of the human body.

CO2 Understands about neurophysiology and receptors

CO3 Gain knowledge about hormones and bioluminescence

CO4 Understanding of stress physiology and endocrine mechanisms will allow them to control their stress and emotions there by diverting their energy towards the positive nation building activities.

CO5 Describecomparative study of sensory receptor in vertebrate.

Course: Paper II Population Ecology and Environmental Physiology

CO1 Explain how ecologists may estimate the density of a species.

CO2 Explain, with examples, how limited resources and trade-offs may affect life histories.

CO3 Explain inter and intraspecific relationship

CO4 Thermal characteristics of the external environmental

CO5 Physiological response to body exercise, meditation ,yoga and their effect.

Course :Paper III Tools and Technology in biology

CO1 Learns about the various instrumentation that are used in analytical laboratories

CO2 Basic knowledge on the theory, operation and function of analytical instruments.

CO3 Understand the application of the instruments that are routinely used for characterization of biomolecules.

CO4 The student will be able to handle the equipment available and identify the suitable and appropriate experiments for their research

CO5: The student would have gained sufficient knowledge about the assays and analyzing data.

Course :Paper IV Molecular, Cell biology and Genetics

CO1 Learn about cells and gene at molecular level.

CO2 Understanding genetics and relate modern DNA technology for diseases diagnostics and therapy.

CO3 Distinguish patterns of inheritance for single gene disorders linked to autosomes, sex chromosomes, and mitochondrial genes.

CO4 Understand about transgenic animals and Knockout animals their application

CO5 Explain elementary idea of human genome project

M.Sc. Third Semester

Course: Paper I Comparative Anatomy of Vertebrates

CO1 Understand comparative method to analyse and critically evaluate the structure and function of vertebrate system.

CO2 Understand the difference between homologous and analogous structure to determine the morphological characters are primitive or derived.

CO3 Assessment of vast variety of vertebrates.

CO4 Acquire the ability to successfully articulate understanding of evolution and organismal system.

CO5 Comparative account of anatomy of various system in vertebrate.

Course: Paper II Limnology

CO1 Gaining basic knowledge of the organisms found in marine and fresh waters, and on the interactions between environmental factors and biological processes in aquatic ecosystems.

CO2 learn about modern analytical and computational methods used in research and in environmental monitoring.

CO3 study how pollution and other human influences affect the aquatic system, from rivers and lakes to coastal and Ocean.

CO4 study of scientific work, critical reading and understanding of scientific literature.

CO5 Explain definition historical development and scope of development

Course: Paper III Ecotoxicology

CO1Describe and interpret the process, scheme generating anthropogenic toxic emissions.

CO2 Compare the level of toxic pollutant evacuated in the environment with the related concentration limits according to specific regulation.

CO3 Access the influence of the toxic compounds released on the public health.

CO4 Access the safety condition and apply related safety regulations when dealing with toxic substances.

Course: Paper IV Aquaculture

M.Sc. fourth semester

Course: Paper I Animal behaviour and neurophysiology

CO1 Understanding and identify behaviour in variety of taxa.

CO2 Learn a wide range of theoretical and practical techniques used to study animal behaviour.

CO3 Develop skills, concepts and experience to understand all aspects of animal behaviour.Rhythmic behaviours, Social behaviours, feeding and Reproductive behaviour

CO4 Describe behaviour assessment

CO5 Explain the relationship of behaviour and Cognition.

Course: Paper II Gamete Biology, Development and differentiation

CO1Identify structures and function of reproductive anatomy in the male and female

CO2 Identify hormones, their production site, physiology impacts and how to manipulate specific hormones to control reproduction either positively or negatively.

CO3Summarize critical components of reproductive technologies involved in breeding, semen collection, gamete biology and embryonic development.

CO4 Provide a comprehensive understanding of the concepts of development and differentiation

Course: Paper III Ichthyology (Fish) structure and function

CO1 Explain the progression and major steps in fish evolution.

CO2 Describe and apply the classification system of fishes.

C03 Apply basic physiological and ecological concepts to fishes.

CO4 Identify major fish groups and local native species, and describe their key characteristics.

CO5 Identify human impacts on fish populations, and the ecosystems in which they live**.**

Course: Paper IV Pisciculture and economic importance of fishes

CO1 Understand the concept of pisciculture,hypophysation, and importance of genetic engineering in fishes.

CO2 Management of hatcheries, nurseries and rearing ponds.

CO3 Know and understand about the drugs useful in induced breeding of fishes.

CO4 Methods of fish preservation and nutritive value of fishes

CO5 Economic importance and by product of fishes**.**

Department of Botany

Programme Specific Outcomes and Course Outcomes of B.Sc. in Zoology Programme

Programme specific Outcomes

PO1*Knowledge and understanding:* The course develop knowledge and understanding of : 1. The range of plant diversity in terms of structure, function and environmental relationships. 2 knowledge of flora of Madhya Pradesh as well as India.

PO2*Skill Development* :a)Intellectual skill:Students will be able to:. 1. Assimilate knowledge and ideas based on wide reading and through the internet. 3. Correlate the knowledge and methods from one topic to another .4. Plan, conduct and write a report for the project.

B) Practical skills: 1) Students learn to carry out practical work, in the field as well as in the laboratory.2)Use modern techniques of biological sciences and able to smooth handle biological equipment and instrumentation as well as biological software.

PO3*Critical thinking and Problem analysis*: Identify the taxonomic position of plants, formulate the research literature, and analyse non reported plants by using methods of nomenclature and classification in Botany. Capable of thinking about the issue of public health and Gathering information of medicinal plant and phytochemical content accordingly.

PO4 *Team work*: Capable of working effectively in diverse teams in both classroom, laboratory, Botany workshop and in industry and field-based situations.

Course Outcomes

B Sc. I st Year

Student will be able to learn following aspects :-

Paper I

CO1 General account of Viruses, Viroid's and Prion. structure, nutrition, reproduction and economic importance of Bacteria, Mycoplasma, Cyanobacteria and Actinomycetes.

CO2 General character, classification and economic importance of Algae. Life history of *Volvox, Oedogoinium, Chara, Voucheria, Ectocarpus* and *Polysiphonia*.

CO3 General character, classification and economic importance of Fungi.Life history *of Albugo, Mucor, Yeast, Peziza, Puccini*a and *Alternaria*. General account of Lichens.

CO4 General character, classification of Bryophyta, Morphology, Anatomy and reproduction of *Riccia, Marchantia, Anthoceros* and *Polytrichum.*

CO5 Important character and classification and stellar organisationof Pteridophyta. Structure,

Anatomy and reproduction of *Lycopodium, Selaginella, Equasetum* and *Marsilea*.

Paper II

CO1 General character, classification and distribution of Gymnosperms. Heterospory and seed habit. Geological time scale and fossilization, types of fossils tools and technique.

CO2 General account of Cycadodiofilicales, Bennettitales, Gnetals and Ginkgoales. Morphology, Anatomy, Reproduction and life cycle of Cycas, Pinus and Ephedra.

CO3 Types of Vascular bundles, Root and Shoot Apical Meristem, Anatomy of Dicot and Monocot Stem and Root, modifications of roots. Root microbial interactions.

CO4 Secondary growth. Anatomy of C3 and C4 plants, Anamalous Secondary growth.

CO5Origin and development of leaf, Anatomy of Dicot and Monocot leaf. Leaf Adaptations, Scenescence and Abscission.

Course outcome B

Sc. IInd Year

Student will be able to learn following topics:-

Paper I

CO1 Origin and Evolution of Angiosperms: Principles and rules of Botanical Nomenclature, Museum, Herbarium and Botanical Gardens. Classification of Angiosperms. APG – IV System.

CO 2 Plant description terminology, Diagnostic characteristics and Economic importance of Families : Ranunculaceae, Brassicaceae etc.

CO 3 Diagnostic characteristics and Economic importance of Families

CO 4 Structure of flower , anther and pistil, Microsporogenesis and megasporogenesis, Pollination, Pollen Pistil interactions and self incompatibility.

CO 5 Double fertilization and triple fusion. Development of Endosperm, embryos in Dicot and Monocots. Polyembryony and Apomixis, Fruit development and maturation, mode of vegetative propagation.

Paper II

CO 1 Structure and types of Ecosystems, Trophic levels, food chains, food web, Ecological pyramids, Energy flow, Concept of Biogeochemical cycles, Carbon, Nitrogen, water, Phosphorus and Sulphur cycle.

CO 2 Ecological adaptations: Morphological, Anatomical and Physiological responses to water, temperature and salts. Plant Succession.

CO 3 Population ecology, community ecology. Biodiversity conservation and hot spots. Biosphere reserves, Sancturies and National parks of M.P. Endangered and threatened species, red data book.

CO 4 Physical and chemical properties of soil, soil profile, classification and composition.

CO 5 Phytogeograpphical regions of India. Vegetation types of M.P. Natural resources and their conservation. Economic and Ethobotany.

Course outcome

B Sc. III rd Year

Student will be able to learn following topics:-

Paper I

CO 1 Properties and importance of water. Plant water relation, Diffusion, Osmosis. Water absorption. Ascent of sap and Transpiration.
CO 2 Mineral nutrition and their absorption. Translocation of organic solutes. Structure classification and functions of Carbohydrates, Amino acids, Proteins and Lipids. Nitrogen fixation, Nitrogen and Lipid Metabolism.

CO 3 Photosynthesis : Pigments, light and dark reaction, C3, C4 and CAM plants. Photorespiration.

CO 4 Respiration :Anaerobic and aerobic, mechanism of respiration: Glycolysis, Kreb's cycle, Pentose phosphate Pathway, Electron transport system, Redox potential and ATP synthesis.

CO 5 Classification, Nomenclature and characteristic of Enzymes. Mode and mechanism of enzyme action. Plant hormones : discovery, structure and mode of action of Auxins, Gibberellins, Cytokinin, Abscisic Acid and ethylene.

Paper II

CO 1 Techniques of cell biology, Prokaryotic and Eukaryotic cell structure, Structure of cell organelles.Cell signaling and cell receptors, singnal transduction.

CO 2 Structure and function of Chromosome, special types of chromosome. Mitosis and Meosis. Variation in chromosome number. Structure and replication of DNA.

CO3 Genetic inheritance : Mendels law of inheritance. Linkage analysis, interactions of genes. Cytoplasmic inheritance.

CO 4 Development of Genetics, Structure of Gene, Genetic code, transcription and translation. Regulation of gene expression in prokaryotes and eukaryotes. Role of RNA in origin and evolution.

CO 5 Plant Breeding: Introduction, selection and hybridization. tissue culture, important achievements of biotechnology in Agriculture. Tools and technique of recombinant DNA technology.

Outcome of the course

M.Sc. I SEM (botany)

PG-101 - Biology & Diversity of Viruses, Bacteria & Fungi

Students will learn about following Aspects :

CO1 Gain a clear knowledge about viruses and prokaryotes cell structure and fungi.

CO2 Know about organisms and causal factor responsible for plant diseases & methods of studying plant diseases.

CO3 It makes students self reliance in the industrial application of Microbiology in life and industry.

CO4 Ability to learn how to cultivate mushroom and how to established entrepreneurship with the gained knowledge.

CO5 Grasping the information about mycoplasma and its economic ideas.

PG 102 - Biology & Diversity of Algae, Bryophytes & Pteridophytes

Students will learn about following points:

CO1 A brief idea about algae, bryophytes and pteridophyte habits and habitat, classification and life history.

CO2 Know basic knowledge about biodiversity of algae, bryophytes and pteridophytic flora.

CO3 Analyze the anatomy, morphology and reproduction of algae, bryophytes and pteridophytes which is helpful in further research about these organism.

CO4 Focus on fossils pteridophytes.

CO5 Understand the useful and harmful activities of Algae.

PG 103 - Biology & Diversity of Gymnosperms

Students will learn about following Aspects :

CO1 Characters, Distribution, Classification, Evolution and Economic importance of Gymnosperms.

CO2 Geological Time Scale, Fossilization process, Types of Fossils. General account of Progymnosperms and Pteridospermales.

CO3 General account of Cycadeoidales, Cordaitales and Pentoxylales.

CO4 Structure, reproduction & inter-relationship of Cycadales, Ginkgoales and Coniferales.

CO5 Structure, reproduction & inter-relationship of Ephedrales, Welwitschiales, and Gnetales.

PG 104 – Plant Ecology

Students will learn about following Aspects :

CO1 Learn the Approaches to the study of Ecology.

CO2 Understand the population & Community Ecology.

CO3 Studied various statistical methods of analysis.

CO4 Learn also about ecological successions.

CO5 Relationship between energy flow & recycling pathways.

M. Sc. II SEM (botany)

PG 201 – Plant Development and Reproduction

Students will learn about following Aspects :

CO1 Unique features of plant development.

CO2 Differences between animal & plant development.

CO3 Floral characteristics, pollination mechanisms and vectors.

CO4 Biochemistry and molecular biology of fruit maturation.

CO5 Vegetative and sexual reproduction.

PG 202 – Morphology and Taxonomy of Angiosperms

Students will learn about following Aspects :

CO1 Morphology of stamens and carpel.

CO2 Morphology of inferior ovary.

CO3 Salient features of International Code of Botanical Nomenclature. Retention of old names and adaption of new names.

CO4 Taxonomic evidences – morphology, anatomy, cytology, embryology, palynology, phytochemistry & Numerical.

CO5 Genome analysis and nucleic acid hybridization.

PG 203 – Utilization and Conservation of Plant Resources and Biostatistics

Students will learn about following Aspects :

CO1 Understand different causes of environmental pollution and their remedies.

CO2Sustainable development and utilization of resources from forest, grassland and aquatic habitats.

CO3 Evaluate the management strategies of different natural resources.

CO4 Reflect upon the different national and international efforts in resource management and their conservation.

CO5 Develop skills in data tabulation, its treatment, analysis, interpretation and graphical representation of data.

PG 204 – Cell Biology of Plants

Students will learn about following Aspects :

CO1 Explain Structural organization of plant cell.

CO2 Describe the structure, Models and functions of Plasma membrane.

CO3 Give an detailed account of Structure and Function of cell organelles.

CO4 Compare the structure and function of cells & explain the development of cells.

CO5 Describe the relationship between the structure and function of biomolecules.

M. Sc. III SEM (botany)

PG 301 – Plant Physiology

Students will learn about following Aspects :

CO 1 Understand Water relation of plants with respect to various physiological processes.

CO2 Explain chemical properties and deficiency symptoms in plants

CO3 Explain flowering processes , photoperiodism and vernalization.

CO4 Classify Cryptochromes and Phytochromes.

CO5 Assess dormancy and germination in plants.

PG 302 – Plant Biochemistry & Metabolism

Students will learn about following Aspects :

CO1 Differentiate anabolic and catabolic pathways of metabolism

CO2 Recognize the importance of Carbon assimilation in photorespiration

CO3 Explain the Electron transport and ATP-Synthesis

CO4 Interpret the Biological nitrogen fixation in metabolism.

CO5 Explain Fundamental of Enzymology – Nomenclature, Classification, Properties and Structure.

PG 303 – Genetics & Cytogenetics

Students will learn about following Aspects :

CO1 Have conceptual understanding of laws of inheritance, genetic basis of loci and alleles and their linkage.

CO2 Comprehend the effect of chromosomal abnormalities in numerical as well as structural changes leading to genetic disorders.

CO3 Develop critical understanding of chemical basis of genes and their interactions at population and evolutionary levels.

CO4 Analyze the effect of mutations on gene functions and dosage.

CO5 Understand about the transposable elements in prokaryotes and eukaryotes.

PG 304 – Molecular Biology of Plants

Students will learn about following Aspects :

CO1 Analyse the structures and chemical properties of DNA and RNA through various historic experiments.

CO2 Gain an understanding of various steps in transcription, protein synthesis and protein modification.

CO3 Examine the structure, function and replication of DNA in prokaryotes and eukaryotes.

CO4 Understand about the cell cycle, Role of cyclins and cyclin dependent kinases.

CO5 Explain apoptosis and mechanism of programmed cell death.

M. Sc. IV SEM (botany)

PG 401 – Plant Cell, Tissue & Organ Culture

Students will learn about following Aspects :

CO1 Describe the history, scope of Plant cell and tissue culture.

CO2 Understand the techniques of tissue culture and tissue culture research in india.

CO3 Understand the fundamental concepts of plant anatomy and embryology

CO4 Analyze and recognize the different organs of plant and secondary growth.

CO5 Application and importance of plant tissue culture.

PG 402 – Biotechnology & Genetic Engineering

Students will learn about following Aspects :

CO1 Understand the core concepts and fundamentals of plant biotechnology and genetic engineering

CO2 Develop their competency on different types of plant tissue culture.

CO3 Analyze the enzymes and vectors for genetic manipulations.

CO4 Examine gene cloning and evaluate different methods of gene transfer

CO5 Critically analyze the major concerns and applications of transgenic technology.

PG 403 – Limnology (Elective-1)

Students will learn about following Aspects :

CO1 General characteristics and classification of lakes.

CO2 Effect of salinity and climate stresses on distribution of phytoplankton

CO3 Gain knowledge on occurrence, characteristics and importance of lake bacteria.

CO4 Study about the Physical and Chemical factors affecting the flora.

CO5 Explain Symbiosis and competition among algae and Impact of human being on algae.

PG 404 – Ethnobotany (Elective-2)

Students will learn about following Aspects :

CO1 Conceptualize ethnobotany as an interdisciplinary science.

CO2 Restate the established methodology of ethnobotany studies.

CO3 Categories various indigenous ethnic groups and their environmental practices.

CO4 Understand the legalities associated with ethnobotany.

CO5 Detailed study of the common plants and their parts used in the treatment of – Expulsion of worms, Skin diseases, Bronchitis & Asthma, Tuberculosis.

Department of Biotechnology Programme Specific Outcome

PO1 Understand the principles and the applications of molecular biology methods with an emphasis on the application of recombinant DNA technology to animals, plants and microbial organisms

PO2 To gain knowledge about the application of various types of Microscopy.

PO3 The course descries the use of genetically engineered products to solve environmental problems and cure human diseases.

PO4 Understand the applications of biotechnology and advances in the different areas like medical, microbial, environmental, bioremediation, agricultural, plant, animal and forensic sciences.

PO5 Students will possess hands-on technical skills necessary to support biotechnology research activity.

Course Outcomes B.Sc.Biotechnology 1st Year Paper 1 cell structure and biology

CO1 Explain the structure of cell according to shape and size.

CO2 Explain the structure and function of bacterial cell and eukaryotic cells

CO3 Understand the cell division, cell to cell interaction and cell locomotion and cell differentiation.

CO4 Explain the role of cell membrane and biomolecules. CO5 Explain necrosis apoptosis and cell death in cancer. Paper 2 microbiology

CO1 Explain about history applications and classification in microbiology.

CO2 Explains structure and diversity of microbes bacteriology.

CO3Understands various methods of staininfg and structure and diversity of algae ,fungi and protozoa.

CO4 Explain about the microbial growth.

CO5 Explains microbial nutrition and metabolism.

Practical work

Learning Outcomes:

1 Learning of various sterilization techniques.

2 Understand isolation of various microorganism from environment.

3 Understand preparation of media.

B.Sc. Biotechnology 2nd Year

Paper 1 Biophysics and Biochemistry

CO1 Explain thermodynamics system and energy flow and conservation.

CO2 Describes the biophysical phenomenon's and explain the effect of environment on them.

CO3 Explains basics of biochemistry functionand structure of biomolecules. CO4
Explain introduction and classification of biomolecules.
CO5 Describes enzyme structures, functions and role in the daily life and metabolic functions.

Paper 2 Bioinstrumentation, Biostatics and Bioinformatics

CO1 Explains the chromatographic and electrophoretic techniques for separation of mixture.

CO2 Explains the lighting effect of the solutions and finding qualitative and quantitative estimation of compounds.

CO3 Explains biostatics tabulation of data and calculation methodology.

CO4 Explain the bioinformatics, use of computers in the research and explains functions of computer.

CO5 Understand the microscopic techniques and types microscopy.

Practical Work

Learning Outcomes :

1 Explains about various instruments like pH meter, microscope etc.

2 Estimation of biomolecules in lab using chemicals qualitatively and quantitatively.

3 Study the effect of external factors of biomolecules like enzyme,protein etc

B.Sc. Biotechnology 3rd Year

Paper 1 Molecular biology and genetic engineering

CO1 Explain the structure and replicating method of DNA and RNA. CO2
Describes chromosomes structure and function of the chromosomes. CO3
Explain the origin of life and concept of evolution.
CO4 Understand the technique of recombinant DNA technology scope and importance. CO5
Explains the role of extra chromosomal DNA like plasmid vectors in RDT.

Paper 2 Applied Biotechnology

CO1 Explain uses of microbes in industrial production. CO2
Understanding the technique of hybridization.
CO3 Teaches immunology and animal biotechnology and organ culture. CO4
Describe the fermentation technology and its types.
CO5 Explain basic concept of environment and environmental biotechnology.

Practical work

Learning Outcomes

1 Extraction of various useful products while using microbes.

2 Extraction and study of DNA of plant and animal.

3 Study the effect of UV and mutagens of DNA of plants and animals.

PROGRAMME SPECIFIC OUTCOMES: B. Sc. PHYSICS

After successful completion of B.Sc. Physics Course student will be able to: PSO1 Understand the depth knowledge of various subjects of Physics.

PSO 2. Gain the knowledge of Physics through theory and practical's.

PSO3. Demonstrate skills and competencies to conduct wide range of scientific experiments.

PSO4. Understand good laboratory practices and safety.

PSO5. Identify their area of interest in academic and Research & Development. PSO5. Develop research oriented skills.

PSO6. Make aware and handle the sophisticated instruments/equipment's.

PSO7. Perform job in various fields such as science, engineering, education, banking, business and public service, etc. with precision, analytical mind, innovative thinking, clarity of thought and expression, systematic approach.

COURSE OUTCOMES

B. Sc. PHYSICS First Year

Paper – I Mathematical Physics mechanics and properties of matter

CO1.Students will have understanding to use vector calculus in various physics problems.

CO2. Know the Cartesian coordinates which have applications in problems with spherical and cylindrical symmetries

C0 3 Know the concept of oscillation with illustrations.

CO4 Describe special relativistic effects and their effects on the mass and energy of a moving object.

CO5 Study different types of forces.

Paper –II Thermodynamics & statistical physics

CO 1.Know the basics of thermodynamics.

Co2 The concept of entropy and change in entropy in different process.

CO3 Know the elementary concept of statistics.

CO4. Know about the different state of a system.

CO 5Know about the partition function and its relation with entropy.

B.sc IIYear

Paper I optics

CO 1 Understand the basic knowledge of principles and theories about the behaviour of light and the physical environment to conduct experiments.

CO2 Understand the principle of superposition of light wave.

CO3 Learn about diffraction at straight edge, circular aperture and circular disc.

CO4 Understand the basic concept of polarization of light.

CO5 Know the history of LASERS and its basic concepts.

Paper II – Electro statistics & magneto statistics & Electrodynamics.

CO 1 Understand the relationship between electrical charge, electrical field and electrical potential.

CO 2 Understand the dipole moment, angular momentum and gyromagnetic ratio.

CO 3 Understand the Kirchhoff's law and analysis of multiloop circuits.

CO 4 Understand the path of charge particles in electric and magnetic field.

CO 5 Know about Faraday's law of induction and Maxwell's equations

B.sc III Year

Paper I Quantum mechanics & spectroscopy

CO1 To become familiar with Blackbody radiation, Photo Electric effect and Compton Effect and hence be aware how quantum theory emerged.

CO2 Study of influence of electric and magnetic fields on atoms will help in understanding Stark effect and Zeeman Effect respectively.

CO3 Understand the symmetric and anti-symmetric wave function.

CO 4 Learn about vibrational energy of diatomic molecule.

CO 5 Know the properties of nucleus likes binding energy, magnetic dipole moment and electric quadruple moment.

Paper II Solid state physics, semiconductor devices & Nano materials.

CO1 A brief idea about crystalline and amorphous substances, about lattice, unit cell, miller indices, reciprocal lattice.

CO 2 Secured an understanding about the dielectric and ferroelectric properties of materials.

CO 3 Learn the basic knowledge of semiconductor physics.

CO 4 Learn how to construct a transistor amplifier and how its gain varies with frequency.

CO 5 Understand synthesis and characterization of nanostructures materials.

M.Sc Physics

Programme specific outcomes

PSO 1 Understanding fundamental concepts of classical and statistical mechanics to put in plain words the explanation of physical events with appreciable limitations.

PSO 2 Refreshing the concepts of electrodynamics, condensed matter physics, Nuclear & particle physics, atomic & molecular physics for better understanding of advanced physical concepts.

PSO 3 Understanding in detail the basic and advanced concepts of quantum mechanics because the nature is governed by regulations of quantum mechanics.

PSO 4 Explicating the essential features of electronic devices and related techniques to have a perceptive of many household electronic devices.

PSO 5 Enhancing the capability of measurements and calculations by introducing a course on computer and programming methods.

PSO 6 Understanding advanced and special/elective subjects like plasma physics, lasers, advanced electronics and their applications for welfare of mankind.

PSO 7 Performing handful of experiments/projects as per program framework.

Course outcomes

M.Sc. I Semester

1.1 COs of the Course 'Mathematical Physics'

CO1 Realizing the basic concepts and applications of tensor analysis and Green's function.

CO2 To have the basic knowledge and application of Bessel's, Legendre's, Hermite's and Laguerre's functions/polynomials.

CO3 To have the basic foundation of integral transforms and complex analysis.

CO4 Understanding group theory and its applications in electronic structure of various crystals.

1.2 COs of the Course 'Classical Mechanics'

CO1 Understanding Langrangian formulation and its applications.

CO2 Realizing Hamiltonian formulation of classical mechanics to explain Kepler's problem and canonical transformations.

CO3 Describing the theory/problems of small oscillations and rotating co-ordinate systems.

CO4 To appreciate the symmetries of space and time including the concepts of invariance, 4-vectors/scalars, Lorentz transformations and Hamiltonian formulation in relativistic mechanics.

CO5 Identifying and solving tutorial problems on above topics given in text and reference books.

1.3 COs of the Course 'Electronic Devices'

CO1 To become skilled at the basic concepts of JFET, BJT, MOSFET, MESFET and microwave devices.

CO2 To study and understand the various photonic devices including diode lasers and their applications.

CO3 To be acquainted with the concepts and applications of digital integrated circuits and operational amplifiers.

CO4 Describing memory devices and the devices based on electro/magneto/acousto-optic, piezoelectric, and surface acoustic effects.

M.Sc II sem.

1.1 COs of the Course 'Quantum Mechanics-I'

CO1 Answering why and how quantum mechanics with understanding of basic postulates and solution of Schrodinger equation for one dimensional problems.

CO2 Having basic knowledge of linear vector space, Bra and Ket algebra, matrix theory and uncertainty relations.

CO3 Solving Schrodinger wave equation for three dimensional problems like H-atom, harmonic oscillator, square well potential and their application to atomic spectra, molecular spectra and deuteron.

CO4 Understanding angular momentum in quantum mechanics, its matrix representation and coupling, Pauli spin matrices and the concept of Clebsch-Gorden coefficients.

1.2 COs of the Course 'Statistical Mechanics'

CO1 Understanding foundations of statistical mechanics and its association with thermodynamics to solve countless physical problems.

CO2 Describing Maxwell-Boltzmann, Fermi-Dirac and Bose-Einstein statistics.

CO3 Explaining cluster expansion of a classical gas, dynamical model of phase transition and Landau theory of phase transition.

CO4 Elucidating thermodynamical fluctuations and Brownian motion on the basis of Langevin's theory and Fokker-Planck equation.

CO5 Solving tutorial problems on above topics.

1.3 COs of the Course 'Electrodynamics and Plasma Physics'

1.4 COs of the Course 'Atomic and Molecular Physics'

CO1 To explain the quantum states of one electron and two electron systems, interaction energy in LS & JJ couplings, hyperfine structure and broadening mechanisms.

CO2 Understanding the types of molecules, energy levels and intensity of their rotational spectra.

CO3 Understanding vibrational spectra of diatomic molecules with inputs of energy levels and operation of IR spectrometer.

CO4 Learning the concepts, techniques and instrumentation of ultraviolet, visible and infrared spectroscopy such as Raman, Photoelectron, Photoacoustic, Mossbauer and NMR spectroscopy.

M.Sc III semester

1.1 COs of the Course 'Condensed Matter Physics-I'

CO1 Realizing the concept and mechanism of imperfections in solids and their several applications in understanding the properties of solids.

CO2 To understand experimental methods of observing imperfections and realizing the use of electron microscopy, scanning, tunneling and atomic force microscopy.

CO3 Understanding extensively the properties of thin films and surfaces and furthermore their potential applications.

CO4 Explaining the concepts of lattice dynamics to understand thermal conductivity and optical properties of solids.

Identifying and solving tutorial problems as per course agenda and answering questions based on them

1.2 COs of the Course 'Nuclear and Particle Physics'

CO1 Learning fundamental nuclear interactions and reactions with probable consequences.

CO2 Understanding nuclear models and associated physics.

CO3 Exploring theories of nuclear decays and general principles of nuclear radiation detectors.

CO4 Acquiring the basic understanding of elementary particle physics with inputs of cosmic rays and their characteristics.

M.Sc IV semester

1.1 COs of the Course 'Condensed Matter Physics-II'

CO1 Understanding interaction of electrons with acoustic and optical phonons, theories of superconductivity with basic ideas of high Tc superconductivity.

CO2 Describing point defects in crystals and structure/symmetries of liquids.

CO3 Learning special carbon solids such as Fullerenes/Tubules and definition, properties, methods of synthesis and techniques for characterization of nanostructured materials.

CO4 Describing disorders in condensed matter with structural description and physics of glasses and liquids.

1.2 COs of the Course 'Lasers '

CO1 Going through the basic foundation and working principle of laser and related physics.

CO2 Understanding the structure and basic operating principle different laser systems and their applications.

CO3 Learning laser induced spectroscopic techniques and application of lasers in fiber optics, medical and engineering.

CO4 Describing the concepts of electro-optic effect, non-linear interaction of light with matter, laser induced multi-photon processes and optical bi-stability.

Programme specific outcomes and Course outcomes of "Geology" [U.G. level]

Student graduating with a B.Sc. in Geology should be able to :-

PO1 Recognize common earth material and structures.

PO2 Place basic geological observation(e.g. rock type, structure and seismicity and volcanism) into a broader plate tectonic frame work.

PO3 Describe howgeologists construct the geological time scale and apply age dating.

PO4 This course on the principles of geomorphology looks at the relationship between geological processes and evolution land forms at a variety of scales in space and time.

PO5 Identification of most common minerals and mineral groups are introduced.

B.Sc I year

Paper-I [Geodynamics and Geomorphology]

Course outcomes:

CO-1 Geodynamics course of study designed to know about various hypothesis of origin of the earth (solar system).

CO-2 Broad perspective of crust, mental and core of the Earth and recognization of the Earth's layers.

CO-3 Knowledge of volcanism isostasy, drifting continents, mid- oceanic ridges, island arcs, earthquakes and their relation with plate tectonics.

CO-4 Classify and describe land forms in a variety of environments settings.

CO-5 Describe internal structure and composition of the earth.

Paper II [crystallography and mineralogy]

Course outcomes:

CO-1The courses specific aim is to acquaint student about crystal structures and their classification in to unit systems and symmetry classes.

CO-2 To acquaint students about various laws of crystallography governing the consistency of crystal structures with respect to specific chemical composition.

CO-3 Mineralogy leads to gain knowledge of composition of rocks and in-turn the earth's composition.

CO-4 To show how elements combine to produce crystal forms introducing the principles of crystallography and mineralogy.

CO-5 To Identify minerals: various properties or criteria are applied like physical properties, chemical composition and optical properties.

B.Sc.II year

Paper-I [Petrology]

CourseOutcomes :

CO-1 To introduce the principle building blocks of the Earth i.e. rocks and their composition, formation and origins.

CO-2 To demonstrate how minerals aggregate form rocks.

CO-3To outline the petrogenesis demonstrating how varieties of minerals and rocks crystallize out in magmatic system.

CO-4Structure and texture ofigneous rocks interpreting crystallizing history.

CO-5 To know about the processes of sedimentation giving rise clastic and nonclastic sediments.

Paper II [Structure Geology]

Course Outcomes:

CO-1 Aim of the branch 'structural geology' is to introduce various mega structure developed in rocks whether contemporary on epigenetic.

CO-2Describe how geological history of an area synthesizes.

CO-3 Relation of structure with tectonic movement.

CO-4Introduction to equipment and field tools to collect data for laboratory analysis.

CO-5 Describe faults on the basis of geometric pattern.

B.Sc III year

Paper- I [Paleontology and stratigraphy]

Course outcomes

CO-1 Demonstrate understanding of the nature of fossils and types of fossilization that turn organic remains into fossils.

CO-2 Use fossils to recognize the age of sedimentary strata.

CO-3 Knowledge of the stratigraphy of India.

CO-4 Demonstrate understanding of the uses of fossils in solving geological problems.

CO-5 Describe processes of fossilization.

Paper II [Earth Resources and Applied Geology]

Course Outcomes

CO-1 Introduction to various processes of mineral deposits formation.

CO-2 Origin and occurrence of coal and petroleum deposits and their distribution in India.

CO-3 Basic idea and application of photogeology in mineral exploration.

CO -4 Introduction to surface and subsurface mining.

CO -4 Describe basics of fossil fuel in India.

B.Sc(Microbiology)- Programme Specific Outcomes and Course Outcomes

Programme Specific Outcomes

PSO 1Knowledge of the diverse places where microbiology is involved

PSO2 Understanding of diverse Microbiological processes.

PSO3 Basic skills such as culturing microbes, maintaining microbes, safety issues related to handling of microbes, Good Microbiological practices.

PSO4 Generation of new knowledge through small research projects.

PSO5 Acquire detail knowledge of industrial production of enzymes, antibiotics and vitamins.

B.Sc I Year

Paper I- General Microbiology and Cell Biology

Students will be able to learn following topics

CO1 Microbiology – Introduction scope and development application of concept of diseases.

CO2 Classification – general character of structure of bacteria, cyanobacteria, actinomycetes

mycoplasma and their detail description.

CO3 Brief Description classification, character of structure nutrition of fungi. General featuresof virus and their mechanism.

CO4 Structural organization and function of cell and cell cycle.
CO5 Isolation technique and maintenance and preservation pure cultures methods.

Paper II- Tools and Technique in Microbiology.

CO1 Principle, working, structure of microscopy ;- (Bright, dark field, phase contrast, UV, fluorescent) and application use of software in microscopy.

CO2 Instrumentation :- Technique, principle, structure of different type of laboratory instrument.

Chromatography: types and its application.

CO3 Various method for identification of unknown microorganism: cell count,Haemocytometry and staining technique .

CO4 Know various culture media and their application. Also understand various physical and chemical means of sterilization.

CO5 Biostatistics and Bioinformatics.

B.Sc II Year

Paper I- Biochemistry and Microbial Physiology

Students will be able to learn following topics

CO1 General properties, classification function, structure – carbohydrates, lipids,proteins and amino acids and application of enzymes.

CO2 Growth and nutrition of microbes.

CO3 Principle of bioenergetics and energy production in an anaerobic and aerobic process pathway.

CO4 Methods of studying microbial biosynthesis (active, passive, osmosis, diffusion etc.).

CO5 Understand energy production by photosynthesis and role of metabolism in cell membrane.

Paper II- Microbial Genetics and Molecular Biology

CO1 DNA and RNA ;- Structure, type, function, importance.

CO2 DNA replication, mechanism of transcription and translation in prokaryotes and eukaryotes.

CO3 Genetic code and lac-operon model and regulation of protein synthesis.

CO4 Genetic Engineering and its technique.

CO5 DNA mutation and DNA repair mechanism.

B.SC III Year

Paper I- Applied and Environmental Microbiology

Students will be able to learn following topics.

CO1 Design and types of fermenters and industrial production of alcohol, antibiotics organic acids.

CO2 Food spoilage and food preservation methods.

CO3 Use of microbes as biofertilizer and microbial disease of crop plant .

CO4 Microbial Interaction: Neutralism, Commensalism, Synergism.

CO5 Waste management and treatment: Primary, Secondary, Tertiary.

Paper II- Immunology And medical Microbiology

CO1 Immune system and its types.

CO2 Antigen – antibody structure, type, properties and Ag-Ab interaction.

CO3 Tumor Immunology: cancer origin and immune diagnosis of tumors.

CO4 Vaccine production and medical importance of blood group.

CO5 Bacterial and viral disease of human and mechanism of pathogenicity.

प्राचार्य
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छिंदवाडा (म.प्र.)

Principal
Govt. P.G. College
Chhindwara (M.P.)