# CO PO & PSO

# ISPAT AUTONOMOUS COLLEGE
# ROURKELA

# Name of the programme: Bachelor of Arts in Anthropology

## PROGRAMME OUTCOMES

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| PO 1 | After completion of the Bachelor of Arts in Anthropology, a student will have a fundamental and coherent understanding of the academic field of anthropology, its different branches, application and relationship with other disciplinary areas or subjects. |
| PO 2 | The learners will have procedural knowledge that create different type of professionals in the field of Anthropology such as research, teaching, government/public services. |
| PO 3 | The students will develop relevant generic skills and global competency such as critical approach to various situations, problem solving skills required to solve anthropological problems with well defined solutions, investigating skills, personal skills like ability to work independently as well as with group. |
| PO 4 | Fieldwork experience enables the students to learn by themselves and experiment with the theoretical knowledge they gain in the classroom. |

## PROGRAMME SPECIFIC OUTCOMES

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| PSO 1 | The programme seeks to develop in students anthropological knowledge that will enable them to think critically about various anthropological phenomena and human situations. |
| PSO 2 | The learner will be able to demonstrate knowledge, beliefs and values of multiple cultures, effectively engage in a multicultural society and interact respectfully with diverse groups. |
| PSO 3 | A learner will develop ability to apply anthropological concepts and theories in real life situations. |
| PSO 4 | Fieldwork is an essential part of the course curriculum. During the field study the students will get opportunity to work beyond the classroom boundary which will develop their communication skills while interacting with local people. |
| PSO 5 | Students will also develop the ability to critically interpret the primary data collected from local people and draw conclusions which will enhance their quantitative and qualitative analytical skills. |
| PSO 6 | The learners will develop ability to identify potential ethical issues in work related situations. |
| PSO 7 | Anthropology provides an intellectual background for students considering the career opportunity in academics, social service, public policy, government services, nongovernment organisations etc. |

# COURSE OUTCOMES

## SEMESTER- I

## Core 1- Introduction to Biological Anthropology

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| **CO 1** | The student will be able to understand the basic concepts biological anthropology, its branches, the scopes of study. The student will also learn how biological anthropology developed as a discipline. |
| **CO 2** | The student will be able identify the difference between traditional methods of study in biological anthropology and modern biological anthropology. |
| **CO 3** | Biological anthropology studies human as a biological animal. Hence, the student will have a comprehensive idea about anatomy of human body, structure of human cell, various evolutionary processes and various theories of organic evolution. |
| **CO 4** | A student will be able analyse the difference between the Modern Human Species and other closely related primate species by studying the "Order Primate" |
| **CO 5** | From the practical component student will get a detailed idea about types of laboratory, various instruments used in anthropometry, somatometry. They will also learn various how to take various anthropometric and somatometric measurements and there application in anthropological research. |

## Core 2- Introduction to Socio-cultural Anthropology

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|---|---|
| **CO 1** | The student will get an orientation to subject matter of anthropology. They will learn the basic concepts socio-cultural anthropology, its branches, the scopes of study, its relation with other social sciences. |
| **CO 2** | The student will learn the various concepts of society and culture. The students will have a clear understanding of different type of societies, social stratification system in various cultures. |
| **CO 3** | The students will be able to analyse and explain the social organisations, social structure, social institutions and social systems when exposed to different cultural settings. |
| **CO 4** | The students will learn the theoretical and practical aspects of ethnographic fieldwork and various methods and techniques used in anthropological fieldwork. |
| **CO 5** | From the practical component student will learn the application of some commonly used techniques and tools of data collection during anthropological fieldwork. |

## SEMESTER 2

## Core 3- Introduction to Archaeological Anthropology

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| **CO 1** | The student will learn the basic concepts of archaeological anthropology, its scopes and relationship with other discipline. |
| **CO 2** | The student will get an insight in to the methodological approaches in archaeological studies and research to reconstruct the human past. |
| **CO 3** | The students will have a detailed understanding of the geochronology of Pleistocene epoch and different type of geoclimatic events occurred during the Pleistocene epoch. They will also learn about various prehistoric cultural phases. |
| **CO 4** | The students will understand and relate the earliest evidences of prehistoric cultures of the world and various prehistoric sites of India. |
| **CO 5** | From the practical component student will learn the identification and interpretation prehistoric tools. |

## Core 4- Fundamentals of Human Origin and Evolution

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| **CO 1** | The student will learn about the origin and evolution of primates. They will classify the animals included in the order primate. |
| **CO 2** | The student will learn the process of human evolution and have an detailed understanding of various evolutionary stages of human. |
| **CO 3** | The students will be able to analyse the theories of human evolution and explain the appearance of modern human in different parts of the world. |
| **CO 4** | The students will be able to analyse and explain the morphological, anatomical, physiological and behavioural changes that occurred in man during the evolutionary process. |
| **CO 5** | From the practical component student will learn various craniometric and osteometric measurements and their application. They will also be able to identifiy various casts of fossil humans based on facial features. |

## SEMESTER 3

## Core 5- Tribes and Peasants in India.

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| **CO 1** | The students will learn the concept of tribe and peasants, their features, classification and distribution. |
| **CO 2** | The students will understand how the tribal groups are governed under the administrative control and learn the constitutional safeguards for tribes in India. The students will be able to analyse how tribes are affected by various developmental schemes and programmes. |
| **CO 3** | The students will have an insight into the Indian Village system, Caste system and its changes in Indian society. |
| **CO 4** | The students will be able to explain how the tribal people and peasant groups are related to the wider world and what processes are responsible for cultural changes among these groups. |
| **CO 5** | The students will be able to evaluate various ethnicity issue and identity issues of tribal and peasant communities. |
| **CO 6** | From the practical component they will learn to read original ethnographies. They can extract relevant information from the same and critically analyse the finding based on contemporary available resources.. |

## Core 6- Human Ecology

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| **CO 1** | The students will learn various concepts of ecology, ecosystem and adaptation. They will understand the various methodological approach to ecological studies. |
| **CO 2** | The students will be able to identify ecologically sensitive zones and organisms and formulate methods to conserve them. |
| **CO 3** | Students will understand the relationship between ecology and state formation. Students can explain how rapid industrialization and urbanisation affect human population. |
| **CO 4** | The students will be able to analyse the cultural aspects of Ecology and explain various modes of adaptation in different environmental condition and in different pre-state societies. |
| **CO 5** | From the practical components they will learn about measurement of various parts of the human body and about preparing a research design on study of any environmental problem. |

## Core 7- Biological Diversity in Human Population

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| **CO 1** | The students will learn various concepts of Biological Variability and the sources of genetic variation. They will also learn the use of various genetic markers in the study of human variation. |
| **CO 2** | The students will be able to interpret and structure the human variation. The students will be able to compare various racial groups in the world. They will learn the contribution of anthropologists in racial classification of Indian population. |
| **CO 3** | Students will learn the concepts of Demographic Anthropology and have an insight in to various demographic processes. They will be able to under the structure of Indian population and its growth pattern. |
| **CO 4** | The students will be able to integrate the biological and cultural approach to study human diversity and explain the role of various bio-cultural factor influencing human disease and nutrition and evolution of human diet. |
| **CO 5** | From the practical component the students will learn the application of craniometry, ABO blood antigen and dermatoglyphics in studying human variation. |

## SEMESTER- 4

## Core 8- Theories of Culture and Society

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| **CO 1** | The students will learn about the classical theories of culture like evolutionism, diffusionism and culture area |
| **CO 2** | Students will have the understanding of emergence of fieldwork tradition in anthropology. They will learn about theories of historical particularism and neo evolutionism. |
| **CO 3** | They will also learn about functionalism, structuralism and other more recent theories. |
| **CO 4** | From the practical component they will learn about formulation of research questions and hypotheses, testing of hypotheses, etc. |

## Core- 9 Human Growth and Development

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| **CO 1** | Students will learn about the concepts of human growth and development. They will also have an understanding of various stages of growth. They will understand the evolutionary perspective of human growth. |
| **CO 2** | Students will be able to interpret the patterns of growth curves, variation from normal growth. They can explain the ethnic and gender differences in growth curves and secular trend. |
| **CO 3** | Students will understand the various biocultural factors influencing growth pattern. |
| **CO 4** | Students will have an insight to the methodological approach to human growth studies through which they can identify various human physique and somatotypes. |
| **CO 5** | From the practical component the students can access growth and nutritional status of individuals. |

## Core 10- Research methods

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| **CO 1** | The students will learn various methods, techniques and tools used in anthropological research and similarities and differences among them. |
| **CO 2** | Students will learn the techniques of reviewing various literatures. They will be able to frame conceptually any research problem, formulate hypothesis, write and publish research articles. |
| **CO 3** | The students will get an insight into various ethical concerns in anthropological research. |
| **CO 4** | The students can analyse raw data by using various statistical techniques. They can differentiate between qualitative and quantitative research |
| **CO 5** | From the practical component they will learn about how to construct tables, make observations and conduct interviews. |

## SEMESTER 5

## Core 11- Prehistoric Archaeology of India

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|---|---|
| **CO 1** | Students will have an understanding of Pleistocene Chronology of India. They will have a detailed understanding of Prehistoric Culture of India. Students will be able to understand the prehistoric culture of Odisha. |
| **CO 2** | Students will have and understanding of different archaeological sites of India and Odisha. |
| **CO 3** | Students will be able to explain the nature of rock art in India. They will also have an understanding of various rock art and rock shelter sites in India and Odisha. |
| **CO 4** | From the practical component students can identify various prehistoric tools, classify tools based on their manufacturing technique. |

## Core 12 Anthropology in Practice

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|---|---|
| **CO 1** | Students will learn various aspects of academic anthropology and applied anthropology. They will be able to explain the difference between the structure, activities and issues in academic anthropology and applied anthropology. |
| **CO 2** | Students will be able to evaluate the role of anthropology in development, formulation of public policy. They will understand cultural resource management. |
| **CO 3** | Students will be able to understand the future dynamics of anthropology and emerging fields in anthropology. Students will learn the biosocial elements of human development. |
| **CO 4** | From the practical component the students will learn the application of anthropological knowledge in various fields. They will be able to create inferences from the census report, prepare report from NGO visits. |

## DSE 1- Anthropology of Religion, Politics and Economy

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| **CO 1** | Students will learn the anthropological approach to study religion. They will have an knowledge of anthropological theories of religion. |
| **CO 2** | Students will learn the economic systems of primitive societies and be able to draw inferences by comparing with contemporary societies. Students can critically examine the relationship between economy and society through by learning various theories of economics. |
| **CO 3** | Students will learn political institutions, concept of power and authority. They will be able to differentiate between state and stateless societies. They can examine world's diverse civilization and origin of modern politics. |
| **CO 4** | Students will be able to evaluate the relationship between religion, politics and economy. |
| **CO 5** | From the practical component students will be able to structure case studies with respective to culture perspective. |

## DSE 2- Tribal Cultures of India.

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|---|---|
| **CO 1** | Students will learn the concept of tribe, characteristics features, classification and distribution of tribes. They will be able to analyse the various racial elements among tribes. |
| **CO 2** | Students will be able to differentiate the concept of Scheduled Tribes, Scheduled Caste and Particularly Vulnerable Tribal Groups. |
| **CO 3** | The students will learn the emic and etic approach of tribal nomenclature. They can understand the arts and aesthetics of tribal societies. |
| **CO 4** | From the practical component they will learn about distribution of various categories of tribes in India and how to write an annotated bibliography and social structure of one of them. |

## SEMESTER -6

## Core 13 – Forensic Anthropology

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|---|---|
| **CO 1** | Students will gain knowledge on Forensic Anthropology and Forensic Sciences. They gain knowledge on application of forensic anthropology in various fields. |
| **CO 2** | Students will learn the basic Human Skeletal Biology. They can analyse and examine various skeletal remains to estimate the age, sex, stature and ancestry. |
| **CO 3** | Students will understand the techniques for personal identification. |
| **CO 4** | From the practical component they will learn about recording, determining and comparing fingerprints, somatometric observations of living persons, identification of blood stain, urine, semen and saliva. |

## Core 14- Fieldwork and Dissertation

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| **CO 1** | Student will have an opportunity to apply anthropological theory, methods and techniques in real life situations by working with various local tribal and rural populations. |
| **CO 2** | They will be able to prepare dissertation based on the data collected from the fieldwork. |

## DSE 3- Demographic Anthropology

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|---|---|
| **CO 1** | Students will learn the concepts of Demographic Anthropology. They will be able to differentiate between demography and population studies. |
| **CO 2** | Students will understand the various theories of demography and demographic transition. |
| **CO 3** | Students will explore the various sources of demographic data. They will be able to understand the Indian Population structure with reference to tribal and no tribal groups. They can evaluate the various population policies in India. |
| **CO 4** | From the practical component they will learn about how to collect demographic data from various sources and prepare a project report on the same. |

## DSE 4-

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|---|---|
| **CO 1** | Students will learn about museums and development of museums in India and world. They will also learn the importance of anthropological museums academics and research. |
| **CO 2** | The students will understand the administration of museums, documentation of museum specimen, arrangement of museum specimen etc. |
| **CO 3** | From the Practical component students will learn the techniques of preservation and conservation of various museum specimens. |

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## PROGRAMME OUTCOMES (POs) – UG

1. Graduates will be able to apply the concepts learnt, in real life situations with analytical skills.
2. Graduates with acquired skills and enhanced knowledge will be employable/ become entrepreneurs or will pursue higher Education.
3. Graduates with acquired knowledge of modern tools and communicative skills will be able to contribute effectively as team members.
4. Graduates will be able to read the signs of the times analyse and provide practical solutions.
5. Graduates imbibed with ethical values and social concern will be able to appreciate cultural diversity, promote social harmony and ensure sustainable environment.

## PROGRAMME SPECIFIC OBJECTIVES (PSOs) - UG:

Graduates will be able to:

1. Explain classical and contemporary concepts within multi-disciplines of commerce, Business, Accounting, Law, Finance, Marketing, and Auditing.
2. Apply the analytical skill acquired in Finance, Marketing and Human Resource domain to provide professional solutions to intricate business situations.
3. Employ effective communication, leadership, collaboration and networking skills to guide the decision process at individual and team levels.
4. Evaluate accounting, taxation, reporting, and compliance procedure of accounting firms as per industry requirements.
5. Illustrate ethical quotient and social responsibilities with respect for core human values in everyday activities.

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
# DEPARTMENT OF COMMERCE

## U.G. Commerce Common Syllabus, Odisha

| Paper | Subject | Paper Code | Full Marks | End-term Marks | Mid-term Marks | Credit Points |
|---|---|---|---|---|---|---|
| | **Semester I** | | | | | |
| 1.1 | Environmental Science | AECC -1 | 100 | 80 | 20 | 4 |
| 1.2 | Financial Accounting | CORE-1 | 100 | 80 | 20 | 6 |
| 1.3 | Business Law | CORE-2 | 100 | 80 | 20 | 6 |
| 1.4 | Micro Economics | GE-1 | 100 | 80 | 20 | 6 |
| | **Total** | | **400** | | | **22** |
| | **Semester II** | | | | | |
| 2.1 | MIL | AECC-2 | 100 | 80 | 20 | 4 |
| 2.2 | Cost Accounting | CORE-3 | 100 | 80 | 20 | 6 |
| 2.3 | Corporate Law | CORE-4 | 100 | 80 | 20 | 6 |
| 2.4 | Macro & Indian Economy | GE-2 | 100 | 80 | 20 | 6 |
| | **Total** | | **400** | | | **22** |
| | **Semester III** | | | | | |
| 3.1 | Corporate Accounting | CORE-5 | 100 | 80 | 20 | 6 |
| 3.2 | Income-tax Law and Practice | CORE-6 | 100 | 80 | 20 | 6 |
| 3.3 | Management Principles and Application | CORE-7 | 100 | 80 | 20 | 6 |
| 3.4 | Business Statistics | GE-3 | 100 | 80 | 20 | 6 |
| 3.5 | E-Commerce | SEC-1 | 100 | 80 | 20 | 4 |
| | **Total** | | **500** | | | **28** |
| | **Semester IV** | | | | | |
| 4.1 | GST and Indirect Taxes | CORE-8 | 100 | 80 | 20 | 6 |
| 4.2 | Fundamentals of Data Management (End Term Exam – 60, Practical – 25, Mid-term – 15 | CORE-9 | 100 | 60<br>25 Practical | 15 | 6 |
| 4.3 | Management Accounting | CORE-10 | 100 | 80 | 20 | 6 |
| 4.4 | Principles of Marketing | GE-4 | 100 | 80 | 20 | 6 |
| 4.5 | Entrepreneurship Development and Business Ethics | SEC-2 | 100 | 80 | 20 | 4 |
| | **Total** | | **500** | | | **28** |
| | **Semester V** | | | | | |
| 5.1 | Computerized Accounting & E-filling of Tax Returns (End Term Exam = 60, Practical = 25, Mid-term = 15 | CORE-11 | 100 | 60<br>25 Practical | 15 | 6 |
| 5.2 | Fundamentals of Financial | CORE-12 | 100 | 80 | 20 | 6 |

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|---|---|---|---|---|---|---|---|
| | Management | | | | | | |
| 5.3 | Elective I (Any *one* of the following) | | DSE-1 | 100 | 80 | 20 | 6 |
| | **A. Accounting and Finance** | Financial Markets, Institutions & Services | | | | | |
| | **B. Banking and Insurance** | Indian Banking and Insurance System | | | | | |
| | **C. Management** | Human Resource Management | | | | | |
| 5.4 | Elective II (Any *one* of the following) | | DSE-2 | 100 | 80 | 20 | 6 |
| | **A. Accounting and Finance** | Financial Statement Analysis and Reporting | | | | | |
| | **B. Banking and Insurance** | Merchant Banking and Financial Services | | | | | |
| | **C. Management** | International Business | | | | | |
| | **Total** | | | **400** | | | **24** |
| | **Semester VI** | | | | | | |
| 6.1 | Auditing and Corporate Governance | | CORE-13 | 100 | 80 | 20 | 6 |
| 6.2 | Business Mathematics | | CORE-14 | 100 | 80 | 20 | 6 |
| 6.3 | Elective III (Any *one* of the following) | | DSE-3 | 100 | 80 | 20 | 6 |
| | **A. Accounting and Finance** | Fundamentals of Corporate Tax Planning | | | | | |
| | **B. Banking and Insurance** | Fundamentals of Investment | | | | | |
| | **C. Management** | Consumer Affairs and Customer Care | | | | | |
| 6.4 | Business Research Methods and Project work | End Term Exam = 50<br>Project = 30<br>Viva-voce = 20 | DSE-4 | 100 | 50<br>30 Project<br>20 Viva-voce | | 6 |
| | **Total** | | | **400** | | | **24** |
| | **Grand Total** | | | **2600** | | | **148** |

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| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | CORE-I | FINANCIAL ACCOUNTING | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the basic knowledge of the terms such asaccounting concepts, conventions, principles, trial balance, Accounting Standards,depreciation, hire purchase and installment purchase,departmental accounts, inter departmental transfer, branch accounting, stock and debtors' system,partnership – admission, retirement & dissolution | |
| CO-2 | Understand different methods of computing depreciation, concepts of Hire Purchase, Installment and Lease, need for departmental accounts, basis for allocation of expenses | |
| CO-3 | Familiarizing the methods of preparation of final accounts, inter-department transfer at cost or selling price, preparation of branch accounts, preparation of accounts using various methods of depreciation and calculation of interest under hire purchase and installment system of accounting | |
| CO-4 | Develop analytical skills in department trading and profit and loss account and balance sheets, stocks and debtors system and final accounts system of sole trader, partnership and hire purchase trading account | |

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| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | CORE-2 | BUSINESS LAW | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the basic knowledge about the law of contract, agreement, offer, acceptance, void, valid and voidable contract, contract of indemnity and guarantee, pledge, pawnee, bailer and bailee, agent and principal, partnership deed, sale and agreement to sell and caveat emptor, consumer, complaint, district forum, right to information, negotiable instruments | |
| CO-2 | Understand the concepts of essentials of a valid contract, free contract, quasi contract, discharge of contract, breach of contract, rights of surety, rights and liabilities of Pawnee, duties and rights of agent, termination of agency, implied authorities of partners, rights and liabilities of partners, contract of carriage of goods and rights of an unpaid seller, consumer protection, right to information, Bill of Exchange, Endorsement, Dishonour | |
| CO-3 | Familiarize the Indian contract Act 1872 for entering into a contract of business, law of agency, Indian partnership Act 1932 for partnership business, sale of good Act, Consumer Protection Act, Right to Information Act, Negotiable Instrument Act 1881 | |
| CO-4 | Evaluate the various kinds of contract, remedies for the breach of contract, liabilities of agents to third party, liabilities of partners and warranties of sale of goods Act, rights of consumer, rights & privilege of Holder in due course. | |

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| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | CORE-3 | COST ACCOUNTING | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the basic knowledge on cost accounting concepts, elements and classification of cost and overheads, levels of material control, purchase and stores control. | |
| CO-2 | Understand the techniques of costing, preparation of cost sheet, Need for material control, control of idle time of labour, methods of calculation of labour turnover and classification of overheads. | |
| CO-3 | Develop the application skill in drafting a cost sheet, estimation of tender, EOQ, Methods of valuing material issue, Analyse the various system of wage payment and methods of costing. | |
| CO-4 | Evaluate the process losses, wastage, scrap, normal and abnormal losses, Treatment of profits in Contract costing. | |

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| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | CORE-4 | CORPORATE LAW | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the basic knowledge on important terms and registration procedures. | |
| CO-2 | Understand the concept of Memorandum of Association, Articles of Association, Prospectus, Doctrine of Indoor Management, Doctrine of Ultravires, issue of shares and debentures, corporate meetings, | |
| CO-3 | Develop the application skill on the structure of company, Incorporation of a company, company meeting, preparation of agenda and minutes | |
| CO-4 | Analyse the role of directors and secretary, rights and liabilities of secretary, Qualification and disqualification of directors and secretary, appointment and removal of directors, powers and liabilities of directors, Director's remuneration, role and duties of company secretary | |

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| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | CORE-5 | CORPORATE ACCOUNTING | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the knowledge in company accounts such as meaning of a company, characteristics of a company, definition of shares, debentures, underwriting and goodwill, types of shares, bonus share, right share and underwriting, liquidation. | |
| CO-2 | Understand the accounting treatment in issue of shares at par premium and discount, issues of debenture,calculation of goodwill and shares and liquidator's statement of affairs. | |
| CO-3 | Develop the application skills to computation of pro-rate allotment, redemption of preference shares and debenture, profit and loss account and preparation of balance sheet of companies (new format). | |
| CO-4 | Familiarize the analytical skills in corporate accounting, calculation of underwriting commission, redemption of debentures in sinking fund method, valuation of shares and liquidator's final statement. | |

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| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | CORE-6 | INCOME TAX LAW & PRACTICE | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
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| CO-1 | Acquire the knowledge about the basic principles and concepts of Income tax. | |
| CO-2 | Understand the rules and provisions of income tax under five heads of income namely, Income from Salaries, Income from House Property, Profits and Gains of Business or Profession, Capital Gains and Income from other sources | |
| CO-3 | Familiarize with the computation of income tax for an individual | |
| CO-4 | Analyse and apply the permissible exemptions and deductions from income under Income tax Act. | |
| CO-5 | Evaluate the income of an individual and the tax payable. | |

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| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | CORE-7 | MANAGEMENT PRINCIPLES AND APPLICATIONS | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the basic knowledge on nature, scope and functions of management, types of plans and organization structure, units of command and direction, communication, span of control, delegation and decentralization. | |
| CO-2 | Understanding the importance of planning methods, Principles of organization, techniques of control and communication in management. | |
| CO-3 | Familiarize the concept with methods and types of plans, develop the concepts of departmentation, delegation, decentralization, staffing. | |
| CO-4 | Analyze the need for motivation theories, leadership styles, techniques in co-ordination & control. | |

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| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | GE-3 | BUSINESS STATISTICS | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the knowledge about the basic concepts of statistics, data collection, measures of central tendency, dispersion, correlation, index numbers and time series | |
| CO-2 | Understand the methods of computation of measures of central tendency, measures of dispersion, Correlation, index numbers and time series | |
| CO-3 | Apply the statistical tools like mean, median, mode, geometric mean, harmonic mean, Range, Quartile deviation, mean deviations, Standard deviation, Co-efficient of variation, Correlation, index numbers and time seriesin business, commerce and research. | |
| CO-4 | Analyse the various statistical techniques and identify their appropriateness in business and economic solutions with the use of Excel and other software. | |

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| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | CORE-8 | GST & INDIRECT TAX | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the basic knowledge of Indirect taxation, GST, CGST, SGST,IGST, Levy and collection of GST , Registration of GST, GST Council and regulatory framework. | |
| CO-2 | Familiarize and understand the concept of direct and indirect taxes, Goods and Service Tax, goods, services, suppliers, business, manufacturer, casual trader, aggregate turnover, input and output tax, tax credits, integrated tax, place, time of supply, assessment, penalties, audit & council. | |
| CO-3 | Develop the application skill of the registration procedure, filing of return and taking input credit. | |
| CO-4 | Analyze the difference between direct and indirect taxation, advantage of GST, procedure relating to levy, collection, exemption, registration under GST. | |

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| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | CORE-9 | Fundamentals of Data Management | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Remember the basic concepts MS – Excel, MS-Access, SQL & HTML program | |
| CO-2 | Understand the basic operations carried out on the above applications | |
| CO-3 | Evaluate various data structure developed based on the data management applications | |
| CO-4 | Apply different application in business environment. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
# DEPARTMENT OF COMMERCE

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | CORE-10 | MANAGEMENT ACCOUNTING | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the knowledge in management accounting in the aspects of scope, objectives, characteristics, functions, significance, limitations, ratio analysis, fund flow and cash flow statements, marginal costing, break even analysis, budget, budgeting and budgetary control, variances. | |
| CO-2 | Familiarize and understand the difference between financial and cost accounting versus management accounting, significance and limitations of financial statements, fund flow versus cash flow statement, significance and limitations in the preparation of fund flow and cash flow statement. | |
| CO-3 | Develop the application skills for computation of contribution, P/V ratio, break even sales and margin of safety in the process of decision-making, setting standards and budget. | |
| CO-4 | Analyzing the financial statement using short-term, long-term, profitability ratios, fund flow and cash flow statements break even analysis, variances. | |
| CO-5 | Preparation of cash flow and fund flow statement to evaluate cash and fund flow of the company, managerial applications of marginal costing, budgets for decision making and control. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
# DEPARTMENT OF COMMERCE

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | GE-4 | PRINCIPLES OF MARKETING | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire basic concepts of market, Marketing, Selling, consumer behaviour, market segmentation components of product mix, pricing, channels of distribution. | |
| CO-2 | Have a comprehensive knowledge on product planning, Market segmentation, functions of middlemen and Sales promotion programme | |
| CO-3 | Familiarize with the application of Modern marketing concepts, Pricing policies, Channel of distribution of goods, personal selling and advertising | |
| CO-4 | Analyze the organisational structure of Marketing, role of marketing for economic development ,effects of Channel of Distribution and recent development in the field of marketing | |
| CO-5 | To gain experience on various pricing strategies, advertising media and qualities of good salesmanship. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
# DEPARTMENT OF COMMERCE

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | CORE-11 | COMPUTERIZED ACCOUNTING & E FILLING OF RETURNS | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the basic knowledge of Tally, database systems, DBMS,Entity,Object,attributes,relationships,keys,SQL, Income tax . | |
| CO-2 | Understand the concepts of Tally ERP, database, functions, components of DBMS, Entity relationship model and types, Income tax return | |
| CO-3 | Developing application skills related to creating and operating organization data in Tally, preparation of financial statements with the help of DBMS, filing income tax return | |
| CO-4 | Analyze and design the computerized accounting package and system | |
| CO-5 | Gain practical knowledge how to manage the company's data in ERP, computation and filing of Individual income tax return online. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
# DEPARTMENT OF COMMERCE

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | CORE-12 | FUNDAMENTALS OF FINANCIAL MANAGEMENT | 6 |

| CO NO | CO- STATEMENTS: On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the knowledge of time value of money, risk, return, capital budgeting, cost of capital, gross working capital, networkingcapital, dividend policy | |
| CO-2 | Understand the concepts of cash flow, causes of risk, relationship between risk and return, types of dividend policy, retained earnings and concepts of working capital. | |
| CO-3 | Developing application skills in calculating time value of money, capital budgeting, calculation of specific cost of capital, dividend distribution and retained earnings, various report on working capital financing. | |
| CO-4 | Analyse the effective rate of interest, compound value of annuity, relationship between risk and return, risk analysis in capital budgeting, weighted average cost of capital, determination of working capital requirements. | |
| CO-5 | Evaluate the techniques of time value of money, risk and return, techniques of capital budgeting, factors determining financial decision making, capital structure, dividend policy and working capital management. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
## DEPARTMENT OF COMMERCE

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | DSE-1 | FINANCIAL MARKETS, INSTITUTIONS AND SERVICES | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | describe the components of financial systems and its role in aneconomy | |
| CO-2 | understand the regulations proposed by governing bodies of financial markets | |
| CO-3 | explain the nature and applicability of different types of financial instruments | |
| CO-4 | Illustrate the functions of various financial institutions. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
# DEPARTMENT OF COMMERCE

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | DSE-2 | FINANCIAL STATEMENTS ANALYSIS AND REPORTING | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | identify the sources of information used in financial statementanalysis | |
| CO-2 | identify the sources of information used in financial statementanalysis | |
| CO-3 | relate the importance of financial statement notes and Supplementary information. | |
| CO-4 | Analyse and interpret the financial statements. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
# DEPARTMENT OF COMMERCE

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | CORE-13 | AUDITING AND CORPORATE GOVERNANCE | 6 |

| CO NO | CO- STATEMENTS: On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the basic knowledge of auditing, objectives of auditing, audit program, audit note book, working paper, voucher, vouching, verification, valuation, reserves & provisions, audit report & investigation. | |
| CO-2 | Understand the importance and limitations of the auditing, internal control, internal check, various modes of appointment of an auditor, qualities of an auditors, qualification and disqualification of an auditor, significance of vouching, causes & reasons for depreciation, reserves & provisions, objectives of investigation, responsibility of management in corporate governance, CSR | |
| CO-3 | Develop the application skills related to vouching of cash book, trading and impersonal ledger accounts, verification & valuation of assets and liabilities, responsibilities of an auditor while verification and valuation of assets & liabilities, reasons & usage of creating various reserves. | |
| CO-4 | Develop the analytical skills in conducting share capital and share transfer audit, Vouching Vs Verification Vs Valuation, provisions of companies act regarding investigation, contents and types of audit report. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
# DEPARTMENT OF COMMERCE

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | CORE-14 | BUSINESS MATHEMATICS | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | gain the knowledge about annuities, matrix, differentiation, integration, logarithms, and LLP | |
| CO-2 | understand the different techniques available in differentiation, integration, matrices and LPP to solve problems | |
| CO-3 | apply learnt techniques on real life business problems | |
| CO-4 | Illustrate various learned techniques with examples. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
# DEPARTMENT OF COMMERCE

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | DSE-3 | FUNDAMENTALS OF CORPORATE TAX PLANNING | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Acquire the basic knowledge of different types of taxes, , corporate taxes, provisions of assessment, appeals, penalties, double taxation relief | |
| CO-2 | Understand the problems and methods of tax planning, tax evasion and tax avoidance, importance and scope of tax planning | |
| CO-3 | Gain ability to solve simple problems related to capital gain, depreciation, set off, slump sale. | |
| CO-4 | Develop the analytical skills in applying rates of tax, computation of tax liability and MAT provisions, clubbing provisions and set off and carry forward of losses, depreciation, scientific research. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA
# DEPARTMENT OF COMMERCE

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | DSE-4 | PROJECT WORK | 6 |

| CO NO | CO- STATEMENTS:<br>On successful completion of this course, students will be able to; | |
|---|---|---|
| CO-1 | Describe the basics and various approaches to research. | |
| CO-2 | Discuss appropriate method to accomplish research studies inthe fields of marketing, HR and Finance. | |
| CO-3 | examine the research, sources of data | |
| CO-4 | Prepare the project with the data. | |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA

## Department of Economics

After successful completion of three year of degree program in Economics a student should be able to:

## PROGRAM OUTCOMES (PO) OF BA

| | |
|---|---|
| PO1 | Understand basic concepts in economics and apply economic principles in real world situations. |
| PO2 | Foster the economic way of thinking. |
| PO3 | Ability to analyse historical and current events from an economic perspective. |
| PO4 | Ability to understand various social issues and economic problems. |
| PO5 | Acquire skills in critical Thinking, Quantitative Reasoning, Problem Solving and Communication. |
| PO6 | Ability to predict the impact of fiscal and monetary policy – use of deficits, changes in the money supply etc. – on overall economic performance. |
| PO7 | Ability to understand the role of government in the economy, including taxing, spending, regulating and producing. |
| PO8 | Ability to suggest of the various economic problems |

## PROGRAM SPECIFIC OUTCOMES (PSO) OF BA

| | |
|---|---|
| PSO1 | Ability to apply knowledge of economics with powerful mathematical and statistical tools |
| PSO2 | Ability to identify, formulate and solve economic problems |
| PSO3 | Ability to perform as a successful economic analyst for industry, trade and commerce, banking and non-banking financial institutions |
| PSO4 | Ability to perform as economic advisors to government and policy makers |
| PSO5 | Acquire knowledge, competency and confidence to take up career in Indian Economic Service, Security Exchange Board of India, Reserve Bank of India etc. |

## COURSE OUTCOMES OF BA IN ECONOMICS

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM I | Core I | **Introductory Micro Economics** | **6** |

| **CO No** | **Co-Statements**<br>**On successful completion of this course, students will be able to** | |
|---|---|---|
| CO-1 | It gives the foundation for economic analysis and problem solving. | |
| CO-2 | Able to analyse consumer behaviour and consumer decisions. | |
| CO-3 | A thorough understanding on firm's production processes and decisions. | |
| CO-4 | Able to analyse labour market and labour behaviour. | |
| CO-5 | Learn to apply micro economic tools and techniques in the operation of real economy | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM I | Core II | **Mathematical Methods for Economics-I** | **6** |

| **CO No** | **Co-Statements**<br>**On successful completion of this course, students will be able to** | |
|---|---|---|
| CO-1 | Enable to solve economic problems with the help of functions and graphs | |
| CO-2 | Enables to analyse economic problems with the help of matrices and determinants | |
| CO-3 | Learn to analyse quantitative methods to describe an economic phenomenon. | |
| CO-4 | Study to analyse and interpret economic policies in the light of mathematical tools of analysis | |
| CO-5 | Permits the student to conduct quantifiable test and create models to predict future economic activities | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM II | Core III | **Introductory Macro Economics** | **6** |

| CO No | Co-Statements<br>On successful completion of this course, students will be able to | |
|---|---|---|
| CO-1 | Understand various concepts of National Income. | |
| CO-2 | To understand measurement of macro economic variables | |
| CO-3 | Understand money and its functions. | |
| CO-4 | To understand classical and Keynesian Determination of income, output and employment. | |
| CO-5 | To understand the inflation and its impact on the economy. | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM II | Core IV | **Mathematical Methods for Economics II** | **6** |

| CO No | Co-Statements<br>On successful completion of this course, students will be able to | |
|---|---|---|
| CO-1 | Enable to solve optimisation problems of goal equilibrium of a household, business firm or policy makers. | |
| CO-2 | Enables to analyse a static equilibrium in which the economic unit or system is modelled as stationary. | |
| CO-3 | Learn to analyse quantitative methods to describe an economic phenomenon. | |
| CO-4 | Study to analyse and interpret economic policies in the light of mathematical tools of analysis. | |
| CO-5 | Permits the student to conduct quantifiable test and create models to predict future economic activities | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM III | Core V | **Micro Economics - I** | **6** |
| **CO No** | **Co-Statements**<br>**On successful completion of this course, students will be able to** | | |

| CO No | Co-Statements<br>On successful completion of this course, students will be able to | |
|---|---|---|
| CO-1 | Understand consumer behaviour and utility maximisation. | |
| CO-2 | To understand income effect and substitution effect, consumer surplus. | |
| CO-3 | Understand theory of production. | |

| | | |
|---|---|---|
| CO-4 | Understand theory of costs. | |
| CO-5 | To understand and explain the Goal of Profit Maximization of firms. | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM III | Core VI | **Macro Economics - I** | **6** |

| **CO No** | **Co-Statements**<br>**On successful completion of this course, students will be able to** | |
|---|---|---|
| CO-1 | To understand consumption and investment function | |
| CO-2 | Understand classical & Keynesian approach to demand for money. | |
| CO-3 | Understand supply of money its determinants. | |
| CO-4 | To understand Fiscal policy and crowding out effect, Optimum Policy mix with IS-LM Model. | |
| CO-5 | Understand Phillips Curve and theory of Trade Cycle. | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM III | Core VII | **Statistical Methods for Economics** | **6** |

| **CO No** | **Co-Statements**<br>**On successful completion of this course, students will be able to** | |
|---|---|---|
| CO-1 | To understand Measure of Central Tendency and Dispersion. | |
| CO-2 | Understand Regression Analysis and Correlation. | |
| CO-3 | Understand Time Series and Index Number. | |
| CO-4 | To understand Sampling. | |
| CO-5 | To understand theory of Probability. | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM IV | Core VIII | **Micro Economics- II** | **6** |

| CO No | Co-Statements<br>On successful completion of this course, students will be able to | |
|---|---|---|
| CO-1 | Understand Structure of perfect competition and its equilibrium. | |
| CO-2 | To understand General Equilibrium and Welfare. | |
| CO-3 | To understand Monopoly, Imperfect Competition & oligopoly. | |
| CO-4 | Understand Price Discrimination. | |
| CO-5 | To understand Theory of Game. | |

| SEMESTER | Paper Code | Subject | Credit |
|---|---|---|---|
| SEM IV | Core IX | **Macro Economics- II** | **6** |

| CO No | Co-Statements<br>On successful completion of this course, students will be able to | |
|---|---|---|
| CO-1 | Understand Modeling of Economic Growth. | |
| CO-2 | Understand Open Economy and Macroeconomic Policy. | |
| CO-3 | Classical and Keynesian Thoughts on Employment and Output Determination. | |
| CO-4 | Understand Phillips Curve. | |
| CO-5 | Understand New Classical Macroeconomic Thoughts | |

| SEMESTER | Paper Code | Subject | Credit |
|---|---|---|---|
| SEM IV | Core X | **Research Methodology** | **6** |

| CO No | Co-Statements<br>On successful completion of this course, students will be able to | |
|---|---|---|
| CO-1 | To learn and appreciate alternative methodologies in terms of sampling designs, data collection techniques and in the methods of data analysis. | |
| CO-2 | Understand concepts of research designing. | |
| CO-3 | Understand Research Proposal and Literature Review. | |
| CO-4 | Understand contents of report writing | |
| CO-5 | Able to understand Common Citation Styles. | |

| SEMESTER | Paper Code | Subject | Credit |
|---|---|---|---|
| SEM V | Core XI | **Indian Economy - I** | **6** |

| CO No | Co-Statements<br>On successful completion of this course, students will be able to | |
|---|---|---|
| CO-1 | Understand Basic Characteristics and of Indian Economy & Colonial Exploitation and its impacts. | |
| CO-2 | Understand Population & Human Development. | |
| CO-3 | Understand Poverty and Unemployment Concepts, their trends in Indian Economy and its measures. | |
| CO-4 | Understand economic planning in India. | |
| CO-5 | Understand NITI Aayog. | |

| SEMESTER | Paper Code | Subject | Credit |
|---|---|---|---|
| SEM V | Core XII | **Development Economics- I** | **6** |

| CO No | Co-Statements<br>On successful completion of this course, students will be able to | |
|---|---|---|
| CO-1 | Understand conceptualizing growth and development, Characteristics of LDCs, measure of Economic Development. | |
| CO-2 | Understand theories of economic Growth & development. | |
| CO-3 | Understand concept of poverty & development | |
| CO-4 | Understand Poverty & Inequality, Agriculture, Industry and Development. | |
| CO-5 | Understand Institutions and Economic Development. | |

| SEMESTER | Paper Code | Subject | Credit |
|---|---|---|---|
| SEM V | DSE I | **Public Economics** | **6** |

| CO No | Co-Statements<br>On successful completion of this course, students will be able to | |
|---|---|---|
| CO-1 | To understand Public Finance and Public Budgets. | |
| CO-2 | To understand Public Expenditure | |
| CO-3 | To understand Public Revenue | |
| CO-4 | To understand Tax Structure in India. | |
| CO-5 | To understand Public Debt. | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM V | DSE II | **Money, Banking and Financial Market** | **6** |

| **CO No** | **Co-Statements**<br>**On successful completion of this course, students will be able to** | |
|---|---|---|
| CO-1 | To understand concept of money and its types. | |
| CO-2 | To understand function of Commercial Bank | |
| CO-3 | To understand Banking Sector Reforms | |
| CO-4 | To understand the functioning of Central Bank. | |
| CO-5 | To understand Public Debt. | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM VI | CORE XIII | **Indian Economy - II** | **6** |

| **CO No** | **Co-Statements**<br>**On successful completion of this course, students will be able to** | |
|---|---|---|
| CO-1 | A thorough understanding on Agricultural Development in India. | |
| CO-2 | Know about the Industrial Development in India. | |
| CO-3 | To know about the Tertiary Sector and HRD. | |
| CO-4 | To know about the External Sector in India. | |
| CO-5 | To understand the Indian Economy and Environment. | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM VI | CORE XIV | **Development Economics - II** | **6** |

| **CO No** | **Co-Statements**<br>**On successful completion of this course, students will be able to** | |
|---|---|---|
| CO-1 | To know about the Population and Development. | |
| CO-2 | To understand Dualism and Economic Development. | |
| CO-3 | To understand Environment and Development. | |

| | | |
|---|---|---|
| CO-4 | To understand Climate Change. | |
| CO-5 | To know about International Trade and Economic Development and Financial Economic Development. | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM VI | DSE- III | **International Economics** | **6** |

| **CO No** | **Co-Statements**<br>**On successful completion of this course, students will be able to** | |
|---|---|---|
| CO-1 | Understand importance of Trade and Trade Theories. | |
| CO-2 | Understand Trade Policy and International Economic Institutions. | |
| CO-3 | Understand Exchange Rate. | |
| CO-4 | Understand Balance of Trade. | |
| CO-5 | Understand Balance of Payments in India. | |

| SEMESTER | Paper Code | **Subject** | **Credit** |
|---|---|---|---|
| SEM VI | DSE- IV | **Project** | **6** |

| **CO No** | **Co-Statements**<br>**On successful completion of this course, students will be able to** | |
|---|---|---|
| CO-1 | To understand problems and framing research questions. | |
| CO-2 | To understand literature review. | |
| CO-3 | To understand methodology and sources of data. | |
| CO-4 | To understand data analysis and findings. | |
| CO-5 | To prepare research report, policy recommendations and references | |

# DEPARTMENT OF HINDI

**After successful completion of three years B.A. course in HINDI a student should be able to :**

## 1.PROGRAM OUTCOMES

| | |
|---|---|
| **PO1** | हिन्दी साहित्य की जानकारी प्राप्ति एवं साहित्य से रुचि बृद्धि होना । |
| **PO2** | लेखन एवं पठन की क्षमता बृद्धि । |
| **PO3** | मानवीय मूल्यों की प्रप्ति । |
| **PO4** | रचनात्मक क्षमता के साथ ज्ञान का विस्तार । |
| **PO5** | समाज सेवा की भावना जागृत होना। |
| **PO5** | गंभीर मनन-चिंतन की बृद्धि। |
| **PO6** | सामाजिक समस्याओं का ज्ञान आहरण करना। |
| **PO7** | राष्ट्रिय प्रेम की जागृति होना। |
| **PO8** | जिम्मेदार और कर्तव्यपरायण बनाना। |
| **PO9** | राष्ट्रीय चेतना जगाना । |
| **PO10** | नारी चेतना जगाना। |
| **PO11** | धर्मनिरपेक्ष की भावना जागृत करना। |
| **PO12** | जाती पांति का खंडन कर एकता स्थापित करना । |

## 2.PROGRAM SPECIFIC OUTCOMES

| | |
|---|---|
| **PSO-1** | हिन्दी भाषा और साहित्य को समझना । |
| **PSO-2** | हिन्दी साहित्य की विभिन्न विधाओं का समझना। |
| **PSO-3** | समृद्ध हिन्दी शब्दावलियों का ज्ञान प्राप्त करना। |
| **PSO-4** | हिन्दी साहित्य के दर्शन को आकलन करना। |
| **PSO-5** | अतीत से वर्तमान तक के हिन्दी साहित्य का मूल्यांकन करना। |
| **PSO-6** | साहित्य के माध्यम से समाज की विविध समस्याओं तक पहुँचना। |
| **PSO-7** | आधुनिकीकरण की दिशा और दशा का आकलन करना। |
| **PSO-8** | विभिन्न साहित्य विधा के द्वारा मानवीय मूल्यों का बोध कराना। |

## COURSE OUTCOMES

### SEMESTER-1

## CORE-1 हिन्दी साहित्य का इतिहास (भाग -1)

| | |
|---|---|
| **CO1** | हिन्दी साहित्य का प्रारम्भिक जानकारी,प्रमुख इतिहास ग्रन्थों का परिचय, काल विभाजन और नामकरण तथा तत्कालीन समाज के विषम परिस्थितियों का ज्ञान प्राप्त होता है। |
| **CO2** | आदिकाल की पृष्ठभूमि,प्रमुख कवि,प्रमुख रचनाएँ तथा काव्य प्रवृतियाँ की जानकारी प्राप्त होता है। |
| **CO3** | भक्तिकाल की पृष्ठभूमि,प्रवृतियां,प्रमुख कवि और रचनाओं की जानकारी मिलती है। |
| **CO4** | रीतिकाल की पृष्ठभूमि, काव्य का परिचय,प्रमुख कवि,रचनाएँ,प्रवृतियों की जानकारी मिलता है। |

## CORE-2 भक्तिकालीन हिन्दी कविता(निर्गुण एवं रामभक्ति काव्याधरा)

| | |
|---|---|
| **CO1** | भक्ति के स्वरूप के साथ साथ रामभक्ति और कृष्ण भक्ति के श्रेष्ठ कवि और उनकी रचनाओं की महत्ता जनता के सामने आ सकी । |
| **CO2** | कबीर के पदों के द्वारा ईश्वर भक्ति,नीति वचन,गुरु की महत्ता,बाह्यडंबर का विरोध को दर्शाया गया है। समाज में फैले रूढ़ि परंपरा अंधविश्वास से मुक्त करने की भाव जागृत किया गया है। |
| **CO3** | ऐश्वर्य प्रेम, गुरु का महत्व दर्शाया गया है । |
| **CO4** | समन्वय भाव,चरित्र निर्माण,आम जनता के प्रति कर्तव्य को प्रतिपादित किया गया है । |

### SEMESTER-2

## CORE-3 (हिन्दी साहित्य का इतिहास (भाग -2)

| | |
|---|---|
| **CO-1** | आधुनिक काल की पृष्ठभूमि, हिन्दी में गद्य विधा का प्रारम्भ,खड़ीबोली का साहित्य विकास दर्शाया गया है । |

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|---|---|
| **CO-2** | राष्ट्रभक्ति की भावना जागृत और साहित्य में नवीन प्रयोगों को दिखाया गया है। |
| **CO-3** | गद्य विधाओं का विकास में उपन्यास और कहानी से परिचित कराया गया है । |
| **CO-4** | नारी जीवन की व्यथा तथा किसान,दलित,शोषित आदिवासी आदि वर्ग की व्यथा के साथ मानवीय मूल्यों से परिचित कराया गया है। |

## Core-4 (कृष्ण भक्ति एवं रीतिकालीन हिन्दी कविता)

| | |
|---|---|
| **CO-1** | आडंबर विहीन निस्वार्थ प्रेम ही मानव को ईश्वर के साथ जोड़ता है। ज्ञान की अपेक्षा प्रेम पर बल दिया गया है। |
| **CO-2** | भक्ति भाव और श्रृंगारिकता का चित्रण मिलता है । |
| **CO-3** | भक्ति एवं शास्त्रीयता का परिचय मिलता है । |
| **CO-4** | प्रेम की अनन्यता का चित्रण किया गया है। |

**SEMESTER-3**

## Core-5 (अनुवाद सिद्धान्त)

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|---|---|
| **CO-1** | अनुवाद का अर्थ स्वरूप और क्षेत्र से परिचित होना। विश्व को एक सूत्र में बांधने का काम अनुवाद कर रहा है। |
| **CO-2** | अनुवाद की प्रक्रिया विधि की शिक्षा देना |
| **CO-3** | अनुवाद के विभिन्न प्रकार एवं विभिन्न सिद्धांतों की जानकारी प्राप्त करना। |
| **CO-4** | अनुवाद की उपयोगिता और उसकी व्यापकता की जानकारी प्राप्त करना। |

## Core-6 (हिन्दी कथा साहित्य-उपन्यास)

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|---|---|
| **CO1** | उपन्यास साहित्य का विकास एवं सामाजिक, राजनैतिक, आर्थिक, पारिवारिक, |

| | |
|---|---|
| | सांप्रदायिक समस्याओं का जानकारी देना । |
| **CO2** | भारतीय समाज के महनतकशवर्ग की समस्या को साहित्य के माध्यम से दर्शाया गया है । |
| **CO3** | उपन्यास साहित्य के माध्यम से नारी की समस्या को दर्शाया गया है । |
| **CO4** | पारिवारिक जीवन एवं बाल मनोविज्ञान को समझाया गया है । |

## Core-7 (हिन्दी कथा साहित्य-कहानी)

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|---|---|
| **CO1** | विभिन्न कहानी द्वारा सामाजिक परिस्थियों से अवगत कराया गया है । |
| **CO2** | भारतीय नारी,भारतीय किसान,मेहनतकाश वर्ग की कारुणिक छवि को दर्शाया गया है । |
| **CO3** | राजनीति क्षेत्र,परिवारिक समस्या,अत्याधुनिकीकरण की समस्या को उजागर किया गया है । |
| **CO4** | तत्कालीन परिस्थियों के साथ मानवीय मूल्यों को दर्शाया गया है। |

**SEMESTER-4**

## Core-8 (कथा इत्तर गद्य साहित्य)

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|---|---|
| **CO1** | उपन्यास और कहानी व्यतीत अन्य नवीन गद्य विधाओं (जीवनी,आत्मकथा,रेखाचित्र,निबन्ध) से परिचित कराया गया है। |
| **CO2** | जीवनी,आत्मकथा,रेखाचित्र आदि विधाओं का परंपरा और विकास को दर्शाया गया है। |
| **CO3** | जीवनी,आत्मकथा,रेखाचित्र,निबन्ध के अंतर को स्पष्टता के साथ बताया गया है। |
| **CO4** | रेखाचित्र और निबन्ध में कुछ विषय को तत्कालीन सामाजिक यथार्थ परिस्थितियों से जोड़ कर दर्शाया गया है। |

## Core-9 (आधुनिक हिन्दी कविता- भाग-1)

| | |
|---|---|
| **CO1** | आधुनिक हिन्दी कविता में ऐतिहासिक विषयों को आधुनिक विचारधाराओं के साथ प्रस्तुत किया गया है। |
| **CO2** | मनुष्य की वैयक्तिक जीवन एवं भाव संवेदना का दिखाया गया है। |
| **CO3** | जयशंकर प्रसाद एवं महादेवी वर्मा की कविताओं में दुख,वेदना तथा प्रेम,रहस्यवाद का परिचय मिलता है। |
| **CO4** | निराला की कविताओं में प्रकृति के सौन्दर्य तथा दरिद्रता से उत्तपन्न समस्या का परिचय मिलता है। |

## Core-10 (भाषा विज्ञान एवं हिन्दी भाषा)

| | |
|---|---|
| **CO1** | भाषा के विभिन्न अव्ययों से परिचित कराया गया है। |
| **CO2** | सभ्यता के विकास में भाषा की महत्वपूर्ण भूमिका को अवगत कराया गया है। भाषा परिवर्तन के कारणों को दिखाया गया है। |
| **CO3** | हिन्दी भाषा के आधुनिक रूप तथा उसके मानकीकरण को दर्शाया गया है। |
| **CO4** | भारतीय समाज में हिन्दी भाषा के महत्व और उपयोगिता को प्रस्तुत किया गया है। |

**SEMESTER-5**

## Core-11 (हिन्दी नाटक और रंगमंच)

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|---|---|
| **CO1** | नाटक विधा के साथ साथ रंगमंच का महत्व से अवगत कराया गया है । |
| **CO2** | भारतीय रंगमंच एवं पाश्चात्य रंगमंच की जानकारी प्राप्त होती है । |
| **CO3** | मोहन राकेश द्वारा प्रस्तुत नाटक में प्रेम,सामाजिक संबंध एवं व्यक्तियों की मानसिक स्थितियों के विषय में जानकारी मिलती है । |

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|---|---|
| **CO4** | पाठक इन समस्त विषयों से सामाजिक जीवन की काला एवं समाज के सूक्ष्म विषयों से परिचित होता है । |

## Core-12 (भारतीय काव्य शास्त्र)

| | |
|---|---|
| **CO1** | काव्य शास्त्रीय ज्ञान के साथ काव्य के विभिन्न सिद्धांतों से परिचित कराया गया है। |
| **CO2** | रस सिद्धान्त के द्वारा मनुष्य के मन में उत्तपन्न विभिन्न भावों की जानकारी प्राप्त होती है। |
| **CO3** | रीति सिद्धान्त एवं अलंकार सिद्धान्त की जानकारी प्राप्त होती है। |
| **CO4** | काव्य को गति एवं लय प्रदान करने वाला छंद की जानकारी मिलती है। |

## DSE-1 (तुलसीदास)

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|---|---|
| **CO1** | तुलसी दास की समसामयिक युग परंपरा की जानकारी प्राप्त होना । |
| **CO2** | तत्कालीन समाज में नारी संबन्धित विचारधाराओं का जानकारी प्राप्त होता है । |
| **CO3** | तुलसी दस की भक्ति भाव एवं समन्वय भाव को दिखाया गया है । |
| **CO4** | रामचरितमानस और विनयपत्रिका में निहित भक्ति,शैली,सौन्दर्य,मानवीय मूल्य, एवं मर्यदा के महत्व ज्ञात होता है। |

## DSE-2 (प्रेमचंद)

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|---|---|
| **CO1** | प्रेमचंद के कथा साहित्य में आदर्शोन्मुखी यथार्थवाद का परिचय मिलता है। साहित्य का उद्देश्य तथा राष्ट्रभाषा का महत्व दर्शाया गया है। |
| **CO2** | प्रेमचंद उपन्यास साहित्य में भारतीय किसानों का दयनीय स्थिति से अवगत कराया गया है। |
| **CO3** | राष्ट्रीय प्रेम की भावना तथा स्वतन्त्रता आंदोलन की जानकारी मिलती है। |

| | |
|---|---|
| **CO4** | समाज में व्याप्त कुप्रथा एवं नारी जीवन की करुण त्रासदी से अवगत कराया गया है। |

## Core-13 (आधुनिक हिन्दी कविता)

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|---|---|
| **CO1** | आधुनिकीकरण की दुर्दशा का परिचय मिलता है । |
| **CO2** | राष्ट्रीय प्रेम की भावना एवं मानवतावादी दृष्टिकोण का परिचय मिलता है । |
| **CO3** | प्रकृति चित्रण का दर्शन होता है । |
| **CO4** | शोषित वर्ग की दशा का चित्रण मिलता है। |

**SEMESTER-6**

## Core-14 (पाश्चात्य काव्यशास्त्र)

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|---|---|
| **CO1** | पाश्चात्य विद्वानों के द्वारा काव्य शास्त्रीय ज्ञान के साथ काव्य के विभिन्न सिद्धांतों से परिचित कराया गया है। |
| **CO2** | प्लेटो के अनुकरण सिद्धान्त से पाठक काव्य के आदर्श रूप एवं अरस्तू के काव्य से मनुष्य दुख और मनोविकारों के शमन के लिए काव्य की उपयोगिता से परिचित होते हैं। |
| **CO3** | कविता और जीवन ,कविता और समाज से संबन्धित विचारों को मैथ्यु आर्नल्ड के सिधान्त से दर्शाया गया है। |
| **CO4** | विविध नवीन विचारधाराओं से परिचित कराया गया है। |

## DSE-3 (कार्यालयी हिन्दी)

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|---|---|
| **CO1** | राजभाषा हिन्दी की सांविधानिक अधिनियमों की जानकारी मिलती है। |
| **CO2** | सरकारी पत्राचार की जानकारी प्राप्त होती है। |
| **CO3** | हिन्दी भाषा में कम्प्युटर के प्रयोग की जानकारी मिलती है। |
| **CO4** | प्रशाशनिक शब्दावली की जानकारी मिलती है। |

## DSE-4 (परियोजना कार्य)

| | |
|---|---|
| **CO1** | लघु शोध प्रबंध की तैयारी की जानकारी मिलती है। |
| **CO2** | शोध कार्य से विधार्थीयों का रचनात्मक ज्ञान का विस्तार होता है। |
| **CO3** | शोध प्रक्रिया की जानकारी मिलती है। |
| **CO4** | शोध हेतु अनेक पुस्तकों के पठन द्वारा ज्ञान का विकास होता है । |

# DEPARTMENT OF HISTORY

## PROGRAMME OUTCOME

| | |
|---|---|
| **PO-01** | **Sound Knowledge of different Historical Periods:** Under the CBCS papers in each semester are devoted to the study of particular Historical phase in the historical in the events along with the study of a few major works by some master Historians of that period. These not only help the students to understand a historical period better, but also reduce the load of study in the concerned area. |
| **PO-02** | **Knowledge on the Development of Historical Events:** While pursing honours course of studies in History it is mandatory that a student develops proper knowledge of the historical events. In this sphere also the present syllabus appears to be illuminating, as it is providing the students with standard and up to date knowledge of historical events, impact, war and history, result. The students may acquire knowledge of the historical events of the Ancient, Medieval, Modern of India and western history in new aspects. |
| **PO-03** | **Develop Understanding on Changing Nature of Historical Perspectives:** The current syllabus is well chosen to represent different events from different angles. They are not only meant to make the students familiar with the dominant events of different ages, but also to open out new perspectives, the student may acquire a knowledge of the changing nature of politics or kingdoms of the changing times. |

## PROGRAMME SPECIFIC OUTCOMES

| | |
|---|---|
| **PSO-01** | Understand the basic themes, concepts, chronology and the Scope of Indian History. |
| **PSO-02** | Acquaint with range of issues related to Indian History that span distinct eras. |
| **PSO-03** | Understand the history of countries other than India with comparative approach. |
| **PSO-04** | Think and argue historically and critically in writing and discussion. |
| **PSO-05** | Prepare for various types of Competitive Examinations. |
| **PSO-06** | Critically recognize the Social, Political, Economic and Cultural aspects of History. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **I** | **C-1** | **History of India-I** | **6** |

| CO NO | CO-Statements: On successful completion of this course students will be able to; |
|---|---|
| **CO-1** | Understand the nature of the sources and interpretations of the ancient Indian history. |
| **CO-2** | Know about the hunter-gatherers and advent of food products with reference to Paleolithic, Mesolithic, Neolithic and Chalcolithic cultures, distribution, subsistence pattern and technological development. |
| **CO-3** | Acquire knowledge about the origin, town planning, economic activity, religious belief, cultural practices and decline of the Harappan civilization. |
| **CO-4** | Understand the socio-political, economic, religious and cultural development North and Central India and the Deccan. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **I** | **C-2** | **Social Formations & the Cultural Pattern of the Ancient World** | **6** |

| CO NO | CO-Statements: On successful completion of this course students will be able to; |
|---|---|
| **CO-1** | Get knowledge about the evolution of humankind with reference to their socio-political institutions. |
| **CO-2** | Understand the economic activity of the ancient world other than India. |
| **CO-3** | Know about the polity, society, religion and economy of the Bronze Age civilizations like the Egyptian and the Chinese civilizations. |
| **CO-4** | Explain the debate regarding the advent of iron and its various implications in Central and West Asia. |
| **CO-5** | Acquire knowledge about the economy and urbanization in ancient Greece and Rome. |
| **CO-6** | Know about Polity of nature ancient Greece and Rome. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **I** | **GE - 1** | **History of India (Earliest Times to 1750)** | **6** |

| CO NO | CO-Statements: After completing this course students will be able to: - |
|---|---|
| **CO-1** | Identify the various source materials for the study of history of ancient India. |
| **CO-2** | Discuss the origin of the Indo-Aryans, the date of the Rig Veda, the socio-religious and political institutions of the Vedic Civilization. |
| **CO-3** | The background to the rise of new religious ideas during the sixth century B.C. in the form of The Buddhism and Jainism. |
| **CO-4** | Trace the foundation of the Mauryan empire, Ashoka and his Dhamma, the Mauryan Administrative system. |
| **CO-5** | Discuss the emergence of the Guptas in ancient India, their extension and consolidation, polity and administration, the causes for the downfall. |
| **CO-6** | Career and achievements of Harshavardhana in proper perspective. |
| **CO-7** | The importance of trade and commerce in the overall economic history of India. |
| **CO-8** | Understand the Bhakti and Sufi movement. |
| **CO-9** | Explain the political turmoil during Mughal rule and development of art and architecture during Mughals. |
| **CO-10** | Explain the expansionist and the consolidation policy of Akbar that he pursued. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **II** | **C - 3** | **History of India-II** | **6** |

| CO NO | CO-Statements: After completing this course students will be able to: - |
|---|---|
| **CO-1** | Understand the economic development, urban growth and social institutions of North and Central India and the Deccan between C 300 BCE and 300 CE. |
| **CO-2** | Know about the political formations of the Mauryan Empire and the post-Mauryan polities like the Kushans and the Satavahanas. |
| **CO-3** | Explain the agrarian and commercial economy, social practices and polity of the Gupta and post-Gupta period. |

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| **CO-4** | Understand the religious beliefs and practices with reference to various theistic cults and the origin of Tantricism. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **II** | **C - 4** | **Social Formation and Cultural Pattern of the Medieval World** | **6** |

| CO NO | CO-Statements: After completing this course students will be able to: |
|---|---|
| **CO-1** | Understand the nature of the tribal organization, economy and culture of the Bedouin Society in Arabia. |
| **CO-2** | Explain the nature of polity and society and administration of the Mongol and the Ottoman Empire. |
| **CO-3** | Discuss the crisis of the Roman Empire. |
| **CO-4** | Develop an understanding about region and culture in Medieval Europe with reference to Carolingian renaissance, witchcraft and magic etc. |
| **CO-5** | Explain the origin and crisis of the feudal society in Europe. |
| **CO-6** | Enable to understand the nature of Judaism and Christianity under Islam. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **II** | **GE - 2** | **History of India-II (1750-1950)** | **6** |

| CO NO | CO-Statements: After completing this course students will be able to: - |
|---|---|
| **CO-1** | Discuss the history of British domination in India started with the subjugation of Bengal to the British imperialist system. |
| **CO-2** | Understand the expansion of the British rule in Mysore and the Maratha state. |
| **CO-3** | Explain the shifting policies of British in their strategy of conquest through Subsidiary Alliance and Doctrine of Lapse. |
| **CO-4** | Know the background to the tribal and peasant movements which took place before 1857. |
| **CO-5** | Understand the purpose of this unit is to briefly discuss the background of the revolt of 1857 in its core areas and the conflicting interpretations of the nature and significance of the revolt. |
| **CO-6** | Know the land revenue settlements made by the British in different parts of India up to 1857. |

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|---|---|
| **CO-7** | Understand the 19th century Indian thinkers and their ideas on various aspects of socio-cultural and religious life. |
| **CO-8** | Discuss the origin and growth of Indian Press, and government policies for the development of education in the colonial and post-colonial period. |
| **CO-9** | Develop understanding on Mahatma Jotirao Govindrao Phule's early life, education, and his social reform activities. |
| **CO-10** | Know how two diverse viewpoints i.e., moderates and extremists emerged in the Congress. |
| **CO-11** | Understand and explain the ideology of Mahatma Gandhi and his mass movements. |
| **CO-12** | Explain the nature of communalism in the last decade of British rule. |
| **CO-13** | Know the evolution of democratic ideas and institutions in India |

| **Semester** | **Paper Code** | **Subject** | **Credits** |
|---|---|---|---|
| **III** | **C - 5** | **History of India III (CE 750 -1206)** | **6** |

| **CO NO** | **CO-Statements: After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Understand the sources of Early Medieval Indian history and concepts like Indian feudalism. |
| **CO-2** | Know the political structure of the time with reference to the regional polities and Arab and Turkish invasion. |
| **CO-3** | Understand the agrarian structure and social changes in Early Medieval India. |
| **CO-4** | Know of the trading activities of the time with references to different forms of trade, mode of exchange, role of guilds etc. |
| **CO-5** | Understand the religious and cultural development of the period. |

| **Semester** | **Paper Code** | **Subject** | **Credits** |
|---|---|---|---|
| **III** | **C - 6** | **Rise of Modern West – I** | **6** |

| **CO NO** | **CO-Statements: After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Understand the debate on transition from feudalism to capitalism. |
| **CO-2** | Know the history of the exploration of the new world—motives and significance. |
| **CO-3** | Understand the meaning and nature of the European renaissance—its spread and impact. |

| | |
|---|---|
| **CO-4** | Acquire knowledge about the reformation movement—its origin and courses. |
| **CO-5** | Develop an understanding of the economic development of the west with reference to price revolution, enclosure movement etc. |
| **CO-6** | Explain the rise of national monarchy and European state system. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **III** | **C - 7** | **History of India-IV (C. 1206 – 1526)** | **6** |

| CO NO | **CO-Statements: After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Understand the nature of the sources of the Delhi Sultanate—literary (Persian and Vernacular) and epigraphic. |
| **CO-2** | Know the political structure of the Delhi Sultanate and as well as provincial powers—their expansion, consolidation, theories of kingship and composition of ruling elites. |
| **CO-3** | Know the nature of social and economic activities of the time. |
| **CO-4** | Understand the religious beliefs and cultural trend of the period with references to Sufi and Bhakti movement and literary and architectural activities. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **III** | **GE - 3** | **Rise of Modern West – I** | **6** |

| CO NO | **CO-Statements: After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Understand the debate on transition from feudalism to capitalism. |
| **CO-2** | Discuss the history of the exploration of the new world—motives and significance. |
| **CO-3** | Understand the meaning and nature of the European renaissance—its spread and impact. |
| **CO-4** | Acquire knowledge about the reformation movement—its origin and courses. |
| **CO-5** | Develop an understanding of the economic development of the west with reference to price revolution, enclosure movement etc. |
| **CO-6** | Explain the rise of national monarchy and European state system. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **IV** | **C-8** | **Rise of Modern West – II** | **6** |

| CO NO | CO-Statements: **After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Know of the meaning and significance of the revolution in printing and war techniques. |
| **CO-2** | Understand the socio-economic and political dimensions of the crisis in Europe in the $17^{th}$ century. |
| **CO-3** | Discuss the political and intellectual issues related to the English Revolution. |
| **CO-4** | Understand the nature and impact of the scientific revolution and the origin of the enlightenment. |
| **CO-5** | Acquire knowledge about the economic doctrine like mercantilism and factors leading to the industrialization. |
| **CO-6** | Understand European politics in the $17^{th}$ and $18^{th}$ with reference to parliamentary monarchy and patterns of absolutism in Europe. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **IV** | **C-9** | **History of India-V (C. 1526-1750)** | **6** |

| CO NO | CO-Statements: **After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Understand the Mughal historiography. |
| **CO-2** | Know about the foundation, consolidation and expansion of Mughal rule in India. |
| **CO-3** | Know of the nature of the rural society and economy with reference to rural tensions, agricultural production, trade route and patterns etc. |
| **CO-4** | Know the political and religious ideals of the time like Sulh-i-Kul, Sufism etc. |
| **CO-5** | Know about the Persian and vernacular sources of the period including court literature, travelogue, memoirs etc. |
| **CO-6** | Understand the nature of political expansion, revenue administration, religious orthodoxy and syncretism under Jahangir and Shahjahan. |
| **CO-7** | acquire knowledge about different aspects of the Mughal empire under Aurangzeb. |
| **CO-8** | Understand the visual culture of the period including painting and architecture. |
| **CO-9** | Understand the patterns of regional politics, the concept of Mughal decline and $18^{th}$ century debate. |
| **CO-10** | Acquire knowledge about the nature of trade and commerce during the period. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **IV** | **C-10** | **Historical Theories and Methods** | **6** |

| CO NO | CO-Statements: **After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Understand the meaning and scope of history. |
| **CO-2** | Understand knowledge regarding concept of historiography and relation between history and other discipline. |
| **CO-3** | Understand the basics of historical research and its methodology. |
| **CO-4** | Understand difference between primary and secondary sources and its importance. |
| **CO-5** | Acquire knowledge about important historiographical writings of ancient, medieval and modern period. |
| **CO-6** | Understand the nature of the theory of historical causation, facts, and objectivity. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **IV** | **GE-4** | **Rise of Modern West – II** | **6** |

| CO NO | CO-Statements: **After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Know of the meaning and significance of the revolution in printing and war techniques. |
| **CO-2** | Understand the socio-economic and political dimensions of the crisis in Europe in the $17^{th}$ century. |
| **CO-3** | Understand the political and intellectual issues related to the English Revolution. |
| **CO-4** | Understand the nature and impact of the scientific revolution and the origin of the enlightenment. |
| **CO-5** | Acquire knowledge about the economic doctrine like mercantilism and factors leading to the industrialization. |
| **CO-6** | Understand European politics in the $17^{th}$ and $18^{th}$ with reference to parliamentary monarchy and patterns of absolutism in Europe. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **V** | **C-11** | **History of Modern Europe I (1789 - 1880)** | **6** |

| CO NO | CO-Statements: **After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Understand the various aspects of the French Revolution like social classes, intellectual currents, Napoleonic consolidation etc. |
| **CO-2** | Know the Industrialization and socio-economic transformation in Europe. |
| **CO-3** | Know about the politics of super power among the European countries. |
| **CO-4** | Understand the nationalism and unification developed among the European countries on eve of the 1st world war. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **V** | **C-12** | **History of India-VI (c 1750-1857)** | **6** |

| CO NO | CO-Statements: **After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Understand the nature of Indian society, economy and polity in the mid-18th century. |
| **CO-2** | Develop knowledge about expansion and consolidation British colonial power in India. |
| **CO-3** | Understand the nature of the colonial state and ideology including army, police, law, the education system etc. |
| **CO-4** | Understand the various aspects of the rural economy and society like land revenue system, commercialization and indebtedness etc. |
| **CO-5** | Develop concepts of deindustrialization, drain of wealth, growth of modern industries etc. |
| **CO-6** | Know about the popular resistances like the Santhal uprising and the Indigo Rebellion. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **V** | **DSE-I** | **History and Culture of Odisha-I** | **6** |

| CO NO | CO-Statements: **After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Know the historical geography of Odisha and dynastic rule in different time period. |
| **CO-2** | Develop understanding on the socio-cultural life of Early and Medieval Odisha. |
| **CO-3** | Understand idea of the growth of urban centers. |

| | |
|---|---|
| **CO-4** | Develop concepts trade and commerce, taxation and land revenue system of Ancient and Medieval Odisha. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **V** | **DSE-II** | **History and Culture of Odisha-II** | **6** |

| CO NO | CO-Statements: **After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Know the political condition of Odisha from Afghan conquest up-to British occupation. |
| **CO-2** | Understand early colonial administration in Odisha. |
| **CO-3** | Understand the resistance movements, growth of nationalist movements and politics in Odisha. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **VI** | **C-13** | **History of India VII (c. 1857 - 1950)** | **6** |

| CO NO | CO-Statements: **After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Understand the cultural changes and socio-religious reform and revivalist movements in India like the Bramho Samaj, Prarthana Samaj, Wahabi and Aligarh movements etc. |
| **CO-2** | Understand the rise of nationalism in India with reference to moderates, extremists and revolutionaries. |
| **CO-3** | Develop understanding of the different aspects the Gandhian nationalism. |
| **CO-4** | Know of the growth of communalism in India with reference to the ideologies and politics of parties like the Muslim League, the RSS and the Hindu Maha Sabha. |
| **CO-5** | Explain the causes and impact of the partition of India in 1947. |
| **CO-6** | Understand the character of post-independence Indian state. |

| Semester | Paper Code | Subject | Credits |
|---|---|---|---|
| **VI** | **C-XIV** | **History of Modern Europe II (1880-1939)** | **6** |

| CO NO | CO-Statements: **After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Develop a concept of capitalist industrialization and the nature of social and economic transformation in Europe from late $19^{th}$ century to 1914. |
| **CO-2** | Understand the rise of nationalism and popular movements in the late $19^{th}$ and $20^{th}$ |

| | |
|---|---|
| | centuries and nature of revolutions like the Bolshevik Revolution of 1917. |
| **CO-3** | Understand the meaning of imperialism and nature of expansion of the European empires culminating in the First World War (1914-1918). |
| **CO-4** | Develop knowledge about Europe between the two world wars with reference to issues like the great depression, the Spanish Civil War etc. |

| **Semester** | **Paper Code** | **Subject** | **Credits** |
|---|---|---|---|
| **VI** | **DSE-III** | **History and Culture of Odisha-III** | **6** |

| **CO NO** | **CO-Statements: After completing this course students will be able to: -** |
|---|---|
| **CO-1** | Know the development of different religion in Odisha and its impact upon the art, architecture and literature. |
| **CO-2** | Understand the evolution of temple architecture. |
| **CO-3** | Develop understanding on the influence of Christian missionaries in education and health of Odisha. |
| **CO-4** | Know emergence of minor religious sects in Odisha. |

| **Semester** | **Paper Code** | **Subject** | **Credits** |
|---|---|---|---|
| **VI** | **DSE-IV** | **Project Report** | **6** |

| | |
|---|---|
| **CO-1** | Students will be able to develop an understanding on "how to write Project Reports?". This paper mainly focuses to create a research environment for the student that will be helpful for her/him in future studies. Besides, students will be able to know the local history, culture and other associated aspects of their own surroundings. |

**DEPARTMENT OF MATHEMATICS**
**PROGRAM OUTCOME OF B.SC (MATHEMATICS)**

| | |
|---|---|
| PO-1 | Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study. |
| PO-2 | A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning. |
| PO-3 | Will have the ability to identify the problems and define the computing requirements, which may be appropriate to its solution. |
| PO-4 | A fundamental as well as a higher level of understanding, compression, analysis and articulation of concept studied. |
| PO-5 | Enhancing students' overall development and to equip them with mathematical modeling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment. |
| PO-6 | Ability to pursue advanced studies and research in pure and applied mathematical science. |

**Program Specific Outcomes B.SC (MATHEMATICS)**

| | |
|---|---|
| PSO-1 | Understanding of the fundamental axioms in mathematics and capability of developing ideas based on them. |
| PSO-2 | Inculcate mathematical reasoning. |
| PSO-3 | Provide knowledge of mathematical techniques and application of mathematical methods. |
| PSO-4 | Nurture problem solving skills, thinking, creativity |
| PSO-5 | Assist students in preparing (personal guidance, books) for competitive exams for higher studies e.g., JAM, CPET |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF MATHEMATICS**

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | CORE-I | CALCULUS | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | After completing the calculus students are able to use Leibnitz's rule to evaluate derivates of higher order. | |
| CO-2 | Able to study the geometry of various types of functions. | |
| CO-3 | Able to evaluate the volumes of solids using techniques of integration. | |
| CO-4 | Able to calculate the length of an arc of a curve whose equations are given in parametric and polar form. | |
| CO-5 | Understand the basic concept of conics, rotation of axes and classification of conics and polar equations of conics. | |
| CO-6 | Able to identify the difference between scalar and vector and acquired knowledge on some the basic properties of vector functions | |
| CO-7 | After completing the course students are expected to be apply knowledge of calculus in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | CORE-II | DISCRETE MATHEMATICS | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | To understand logical concepts and to show logical equivalences by using truth tables and rules in logics. | |
| CO-2 | Understand the results involving divisibility and greatest common divisors and solve systems of linear congruences. | |
| CO-3 | Learn concept related to counting and advanced counting. | |
| CO-4 | Use computational techniques and algebraic skills essential for the study of systems of Linear equations. | |
| CO-5 | Evaluate the Eigen values and Eigen Vectors of the matrix. | |
| CO-6 | Assimilate various graph theoretic concepts and familiarize with their applications | |
| CO-7 | After completing the course students are expected to be apply knowledge of Discrete Mathematics in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | GE-I | CALCULUS AND DIFFERENTIAL EQUATIONS | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Able to trace different types of curves, calculate the length of arcs of a curve whose equation is given and find the asymptotes of curve. | |
| CO-2 | Understand the concept of derivatives and able to apply it and also able to use L'Hospital rule and series expansion. | |
| CO-3 | Able to understand the concept of limit and continuity, partial derivatives and its applications. | |
| CO-4 | To understand the concept of differential equation and familiarizes with their form and able to solve. | |
| CO-5 | After completing the course students are expected to be apply knowledge of calculus and differential equations in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | CORE-III | REAL ANALYSIS | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Understand many properties of the real line $\mathbb{R}$. | |
| CO-2 | Learn to define sequence in terms of functions from $\mathbb{R}$ to a subset of $\mathbb{R}$. | |
| CO-3 | Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence | |
| CO-4 | Apply the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers. | |
| CO-5 | Understands limits and their use in sequences, series, differentiation. | |
| CO-6 | Understand the consequences of various mean value theorems for differentiable functions | |
| CO-7 | After completing the course students are expected to be apply knowledge of Real Analysis in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | CORE-IV | DIFFERENTIAL EQUATIONS | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | A student completing the Differential Equation is able to solve differential equations and is able to model problems in nature using Ordinary Differential equations. | |
| CO-2 | This is also prerequisite for studying the course in Partial Differential equations and models dealing with Partial Differential Equations. | |
| CO-3 | Able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. | |
| CO-4 | Gain the idea of equilibrium points and interpretation of phase plane. | |
| CO-5 | After completing the course students are expected to be apply knowledge of Differential Equations in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | GE-II | CALCULUS AND DIFFERENTIAL EQUATIONS | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Able to trace different types of curves, calculate the length of arcs of a curve whose equation is given and find the asymptotes of curve. | |
| CO-2 | Understand the concept of derivatives and able to apply it and also able to use L'Hospital rule and series expansion. | |
| CO-3 | Able to understand the concept of limit and continuity, partial derivatives and its applications. | |
| CO-4 | To understand the concept of differential equation and familiarizes with their form and able to solve. | |
| CO-5 | After completing the course students are expected to be apply knowledge of calculus and differential equations in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | CORE-V | THEORY OF REAL FUNCTIONS | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Gain knowledge on indeterminate form and Use of L'Hospital rule | |
| CO-2 | Able to solve problems involving derivative and its application Geometrical representation and problem solving on MVT and Rolle's theorem. | |
| CO-3 | Able to understand continuity of functions and its properties, uniform continuity, differentiability of functions, algebra of functions, Taylor's Theorem and its applications. | |
| CO-4 | Gain knowledge on Riemann Integral and its properties in detail, leading to fundamental theorem of calculus and Mean value theorems. | |
| CO-5 | Able to test convergence of improper integrals of first and second kind. | |
| CO-6 | Understand the concept of pointwise and uniform convergence of sequences and series of functions. | |
| CO-7 | Able to test of uniform convergence of sequence and series, understand integrability and theorems on integrability. | |
| CO-8 | After completing the course students are expected to be apply knowledge of Theory of Real Functions in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | CORE-VI | GROUP THEORY-I | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Gain knowledge of elementary properties of Groups. | |
| CO-2 | understands cyclic groups, permutation<br>groups, normal subgroups and related results | |
| CO-3 | Evaluate the order of an element of the group and order of the permutation | |
| CO-4 | Apply the Lagrange's Theorem to check the given subset is a subgroup of a group or not. | |
| CO-5 | Understand group homomorphism &<br>Isomorphism and related theorem | |
| CO-6 | After completing the course students are expected to be apply knowledge of Group Theory in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | CORE-VII | PARTIAL DIFFERENTIAL EQUATION AND SYSTEM OF ODEs | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Understand concept of Partial differential equations and classification, solution by Lagrange's method and Charpit's method. | |
| CO-2 | Able to solve wave and heat equations. | |
| CO-3 | Gain knowledge about Classification of second order linear equations as hyperbolic, parabolic or elliptic. | |
| CO-4 | Able to solve homogeneous linear systems with constant coefficients. | |
| CO-5 | After completing PDEs & Systems of ODEs, a student will be able to take more courses on wave equation, heat equation, diffusion equation, nonlinear equations etc. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | GE-III | ALGEBRA | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Able to understand relation, ordering, logical concepts and show logical equivalence by using truth tables, logical arguments. | |
| CO-2 | Understand the results involving divisibility and greatest common divisors. | |
| CO-3 | Understand the concepts of minor, cofactor, rank, nullity of matrices, system of linear equations, row reduction and Echlon's form. | |
| CO-4 | Evaluate the eigen values and eigen vectors. | |
| CO-5 | After completing the course students are expected to be apply knowledge of Algebra in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | CORE-VIII | NUMERICAL METHODS AND SCIENTIFIC COMPUTING | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | The problems which cannot be solved by usual formulae and methods can be solved approximately by using numerical techniques | |
| CO-2 | Gain knowledge of fitting curve to the data by using different methods of interpolation as well as extrapolation | |
| CO-3 | Able to determine approximate value of an integral using Simpson's and Trapezoidal rule. | |
| CO-4 | Able to find approximate solution of difficult differential equation using numerical technique. | |
| CO-5 | After completing the course students can handle physical problems to find the approximated solutions. After getting trained a student can opt for the advance courses in Numerical Analysis in higher mathematics and can apply in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | CORE-IX | TOPOLOGY OF METRIC SPACES | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Understand of basic mathematical tools such as open & closed sets, continuity, in metric space. | |
| CO-2 | Gain knowledge of the notion of distance, convergent sequence and continuity of functions. | |
| CO-3 | Gain the idea of Countability and Separability. | |
| CO-4 | Understand Contraction mappings and Applications. | |
| CO-5 | Understand the concept of connectedness, Local connectedness, Bounded sets and compactness, other characterization of compactness | |
| CO-6 | on successful completion of the Topology of Metric Spaces students will learn to work with abstract topological spaces. This a foundation course for all analysis courses in future. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | CORE-X | RING THEORY | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Able to define ring and subrings. | |
| CO-2 | Gain knowledge of ideals and concept related to ideal. | |
| CO-3 | Able to identify an ideal is a prime ideal or maximal ideal. | |
| CO-4 | Gain knowledge of polynomial ring over commutative ring. | |
| CO-5 | Understand integral domain and related properties. | |
| CO-6 | After completing this course this will help students to continue more courses in advanced Ring Theory modules, Galois groups. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | GE-IV | ALGEBRA | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Able to understand relation, ordering, logical concepts and show logical equivalence by using truth tables, logical arguments. | |
| CO-2 | Understand the results involving divisibility and greatest common divisors. | |
| CO-3 | Understand the concepts of minor, cofactor, rank, nullity of matrices, system of linear equations, row reduction and Echlon's form. | |
| CO-4 | Evaluate the eigen values and eigen vectors. | |
| CO-5 | After completing the course students are expected to be apply knowledge of Algebra in the areas of their own interest. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | SECC-II | QUANTITATIVE APTITUDE AND LOGICAL THINKING | 4 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Demonstrate the ability to understand and communicate the mathematical principles and to follow the extended line of formal reasoning. | |
| CO-2 | A student who is competent in Quantitative Reasoning is able to read and identify mathematical information that is relevant to a problem. | |
| CO-3 | After completion it will help the students for competitive exams like Banking, SSC, OPSC, UPSC, OSSSC etc. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | CORE-XI | MULTIVARIABLE CALCULUS | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Study functions and several variables. | |
| C0-2 | Study the notion of Continuity and Differentiability of multivariate functions. | |
| C0-3 | Able find extreme values of multivariable Functions using derivatives. | |
| C0-4 | Able to calculate double and triple integration and line integral. | |
| C0-5 | Gain knowledge of basic vector calculus including Green's theorem, Divergence theorem and Stokes theorem. | |
| CO-6 | After completion the Multivariable Calculus a student will able to calculate partial derivatives, directional derivatives, extremum values and can calculate double, triple and line integrals. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | CORE-XII | LINEAR ALGEBRA | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Understand the basic concepts of vector space and subspaces. | |
| CO-2 | Able to test a given set of vectors is a basis or not. | |
| CO-3 | Calculate the dimension of a vector space | |
| CO-4 | Understand the basic concept of Linear transformations, null space, range, rank and nullity of a linear transformation. | |
| CO-5 | Able to find out rank and nullity of a matrix linear of transformation. | |
| CO-6 | Gain knowledge of properties of inner product spaces and determine orthogonality in inner product spaces. | |
| CO-7 | Construct the orthonormal basis using Gram Schmidt Orthogonalization process | |
| CO-8 | Able to determine minimal solutions to Systems of linear equations | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | DSE-I | LINEAR PROGRAMMING | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Able to Solve the LPP using Simplex method. | |
| CO-2 | Evaluate minimization problem using Big 'M' Method and formulate the dual problem from primal. | |
| CO-3 | Formulate a dual problem and solve it. | |
| CO-4 | Able to Solve the LPP using Two phase method, Dual Simplex Method. | |
| CO-5 | Gain knowledge about Transportation Problems, Assignment Problems and their applications. | |
| CO-6 | Know the application of linear Programming method in Game Theory | |
| CO-7 | After completion of this course this helps the students to deal industrial models. This is also prerequisite for studying advance courses in NLPP. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | DSE-II | PROBABILITY AND STATISTICS | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Understand the basic principles of probability including probability of events, rules of probability, conditional probability, independent events, Bayes theorem and use these principles in problem solving situations. | |
| CO-2 | Understand the definitions of discrete, continuous, and joint random variables, compute the mean, variance and covariance of random variable. | |
| CO-3 | Know the definition of density and distribution Function of a random variable and be able to find one from the other. | |
| CO-4 | Able to define the binomial, uniform, Poisson, negative binomial, hypergeometric, exponential, Gamma, Beta and normal random variables, know their probability density and distribution functions, compute the mean and variance of these random variables, and use the normal and Poisson distributions to approximate binomial probabilities. | |
| CO-5 | Able to evaluate Moment-generating Function. | |
| CO-6 | Gain knowledge of sampling distribution of mean, Central Limit theorem, Sampling distribution of the mean: finite populations, chi-square, t, F distributions. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | CORE-XIII | COMPLEX ANALYSIS | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Compute sums, products, quotients, conjugate, modulus, and argument of complex numbers. | |
| CO-2 | Define and analyze limits and continuity for complex functions as well as consequences of continuity. | |
| CO-3 | Able to determine a given function is analytic or not. | |
| CO-4 | Understand the basic methods of complex integration and application in contour integration and evaluation of integral using Cauchy's Theorem & Cauchy's Integral Formula. | |
| CO-5 | Able to evaluate contour integral using residue formula. | |
| CO-6 | After completion of this course the students will be able to handle certain integrals not evaluated earlier and will know a technique for counting the zeros of polynomials. This course is prerequisite to many other advance analysis courses. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | CORE-XIV | Group-theory-II | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Understand basic concept of Automorphism, inner automorphism, automorphism groups, automorphism groups of finite and infinite cyclic groups. | |
| CO-2 | Gain knowledge of Commutator subgroup and its properties. | |
| CO-3 | Get idea of direct products, group actions, class Equations. | |
| CO-4 | Know Sylow's theorems and consequences | |
| CO-5 | Know Cauchy Theorem and its application | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | DSE-III | DIFFERENTIAL GEOMETRY | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| | Understand of basic terms, tangent, principal Normal, binormal, curvature & torsion. | |
| | Able to find curvature and torsion using Serret-Frenet formula. | |
| | Able to derive equation of involute and evolute of a curve. | |
| | Calculate E, F, G; L, M, N and write first fundamental and second fundamental form. | |
| | Gain knowledge on lines of curvature, Asymptotic line, developable surface, minimal surface. | |
| | Gain basic knowledge on geodesic and related properties. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | DSE-IV | PROJECT | 6 |

| CO NO. | CO-STATEMENT<br>On successful completion of this course, students will able to; | |
|---|---|---|
| CO-1 | Gain the knowledge of surfing material related to the minor project topic and get idea how to write dissertation and able to speak before a group of people on topic as they have to present seminar before their friends and teachers during the pursue of the project which is the pre-step to do major project in M.Sc. level. | |
| CO-2 | Writing dissertation, they get involve more precisely with the subject which helps them in future to take challenge in life. | |

## ISPAT AUTONOMOUS COLLEGE,
## ROURKELA

# DEPARTMENT OF PHILOSOPHY

After successful completion of three years of B.A. Programme in the subject Philosophy, a student should be able to: -

### PROGRAMME OUTCOME (PO) OF B.A.

| | |
|---|---|
| **PO1-** | Students will demonstrate creative thinking, analysis & synthesis of information. |
| **PO2-** | Students will effectively develop interpret & express ideas through written, oral and visual communication. |
| **PO3-** | Students will develop the social responsibility to build a better society. |
| **PO4-** | Students will relate choices, actions& consequences to Ethical Decision-making. |
| **PO5-** | Be able to apply relevant philosophical analysis to “real world” situation. |
| **PO6-** | The study of philosophy enhances a person’s problem-solving capacities. |
| **PO7-** | Philosophy provides training in the construction of Clear formulation, valid arguments & appropriate examples. |
| **PO8-** | Philosophy helps us to think independently & it broadens our perspective on life. |

# PROGRAMME SPECIFIC OUTCOME (PSO) OF B.A.

| | |
|---|---|
| **PSO1** | Recognizing and understanding different values-personal, social & global and their harmonious relations. |
| **PSO2** | To understand the distinctive features of each philosophical systems either traditional, contemporary or modern and value them. |
| **PSO3** | Acquiring knowledge to develop the valid argumentation. |
| **PSO4** | To understand the moral and ethical implications & to learn applying them by all spheres in our life. |
| **PSO5-** | With the knowledge in philosophy students can attain the capacity to become either a good philosopher, counselor, Academician, Politician & social scientist. |

# COURSE OUTCOMES OF B. A. IN PHILOSOPHY

| | **GENERAL PHILOSOPHY (CC1)** |
|---|---|
| **CO-1** | Students will learn what kind of subject is philosophy, Its various definitions, its nature & how philosophy is related to other subjects like science, and religion. it also provides knowledge about the branches of philosophy. |
| **CO-2** | Students will learn about the theory of ultimate reality, whether the material stuff of the universe is matter or idea, various forms of monism, pluralism, etc. |
| **CO-3** | Students will learn what is knowledge, its sources, the validity & invalidity of knowledge. Various theories of truth, does truthrepresent reality. |
| **CO-4** | Students will learn what is good & what is evil? Is happiness for individual or general? |

| | **LOGIC & SCIENTIFIC METHOD (CC2)** |
|---|---|
| **CO-1** | Students will what is logic, argument, kinds of logic sound and unsound arguments. |
| **CO-2** | Students will learn classification of proposition on the basis of quality and quantity, how the word is different from term, and the distribution of terms in universal and particular propositions. |
| **CO-3** | Students will learn wbout the immediateinference like conversion, obversion & Mediate inference like syllogism,figure and mood of syllogism testing the validity of arguments by syllogistic method. |
| **CO-4** | Students will learn about inductive logic, the procedure of the inductive method, mill's experimental method. |

| | **SYSTEMS OF INDIAN PHILOSOPHY (CC-3)** |
|---|---|
| **CO-1** | Students will learn about the Indian philosophy,schools of Indian philosophy,Upanishad ,veda .and the first heterodox school carvak, |
| **CO-2** | Students will learn about jaina school, its epistemology,metaphysics. |
| **CO-3** | Students will learn about Buddha school,four noble truth, eightfold path nirvana etc. |
| **CO-4** | Students will learn about Samkhya school . |

| | **SYMBOLIC LOGIC (CC4)** |
|---|---|
| **CO-1** | Students will learn about the introduction of symbolic logic |
| **CO-2** | Students will learn the calculus of proposition from section 1-6 |
| **CO-3** | Students will learn the calculus of proposition from section 7-9 |
| **CO-4** | students will learn prediacate calculus. |

| | **ETHICS(CC5)** |
|---|---|
| **CO-1** | Students will learn about ethics & how it is related to other subjects. |
| **CO-2** | Students will learn the distinction between moral and non moral action. |
| **CO-3** | Students will learn the various theories of pleasure, is it for individual or all? |
| **CO-4** | From this unit, students will learn the various theories of punishment. |

| | HISTORY OF GREEK PHILOSOPHY (CC6) |
|---|---|
| **CO-1** | Students will learn about western philosophy, origin of philosophy and various features. |
| **CO-2** | Students will learn on pre-Socratic philosophers especially Thales, Parmenides, Heraclitus, Democritus. |
| **CO-3** | Students know about the philosophy of Socrates and his method,ethics. |
| **CO-4** | Student know the philosophy of plato &Aristotle. |

| | SYSTEMS OF INDIAN PHILOSOPHY-2 (CC7) |
|---|---|
| **CO-1** | Students will know about the Indian philosophy and the Upanishad's concept of ultimate reality. |
| **CO-2** | Students know on Nyaya school, especially on epistemology. |
| **CO-3** | Students will learn about Vaishesika school, especially on categories. |
| **CO-4** | Students will learn about the philosophy of samara and Ramanuja on Advaita, Visistadvaita. |

| | CONTEMPORARY INDIAN PHILOSOPHY(CC-8) |
|---|---|
| **CO-1** | Students will learn about the philosophy of Tagore and Vivekananda |
| **CO-2** | Students will know on the philosophy of Aurobindo. |
| **CO-3** | Students will learn on Gandhian philosophy and Ambedkar. |
| **CO-4** | Students will know about the philosophy of Radhakrishnan and J Krishnamurthy. |

| | HISTORY OF MODERN EUROPEAN PHILOSOPHY (CC9) |
|---|---|
| **CO-1** | Students will learn the method of Bacon and Descartes. |
| **CO-2** | Students know the philosophy of Spinoza and Leibnitz. |
| **CO-3** | Students will learn about the philosophy of john Locke as an empiricist and David Hume. |
| **CO-4** | Students will learn about the philosophy of Immanuel Kant and how he reconciled empiricists and rationalists. |

| | PHILOSOPHY OF LANGUAGE (CC10) |
|---|---|
| **CO-1** | Students will learn what is word its meaning |
| **CO-2** | Students will know the various definition of the word. |
| **CO-3** | Students will know the distinction between sentence and proposition. |
| **CO-4** | Students will learn on the nature of truth and various theories of truth. |

| | MEDITATION OF RENE DESCARTES (CC11) |
|---|---|
| **CO-1** | Students will read a western classic of Rene Descartes. His method ofdoubt proves the certainty of self through wax argument. |
| **CO-2** | Students will learn clear perception and distinction of ideas .and also proves the existenceof God. |
| **CO-3** | Students know God as nodeceiver. |
| **CO-4** | Students will learn how Descartes made mind and body as twodistinct categories. |

| | ISHA UPANISHAD (CC12) |
|---|---|
| **CO-1** | students will learn what is Upanishad and its significance in Indian philosophy. |
| **CO-2** | students will know Isa Upanishad from verse 1 -9 |
| **CO-3** | students will learn verses 10-14 |
| **CO-4** | students will learn verses 15-18. |

| | PHILOSOPHY OF BHAGAVAD GITA (DSE-1) |
|---|---|
| **CO-1** | Students will read Bhagavad Gita's concept of dharma. |
| **CO-2** | Students will learn about Niskama karma yoga. |
| **CO-3** | Students will know what is knowledge about absolute and knowledge of the material world. |
| **CO-4** | Students will know the different kinds of bhakti. |

| | PHILOSOPHY OF RELIGION (DSE-2) |
|---|---|
| **CO-1** | Students will learn on introductory on philosophy of religion and proofs for the existence of God. |
| **CO-2** | Students know on which grounds God can be denied. |
| **CO-3** | Students will know about the problem of evil. |
| **CO-4** | Students will understand the problems of religious language. |

| | SOCIAL & POLITICAL PHILOSOPHY(CC13) |
|---|---|
| **CO-1** | Students will learn social philosophy. |
| **CO-2** | Students will learn the political ideals. |
| **CO-3** | Students will learn about democracy and how it will function properly. |
| **CO-4** | Students will learn about political ideologies. |

| | APPLIED ETHICS (CC14) |
|---|---|
| **CO-1** | Students will learn about applied ethics. |
| **CO-2** | Students will learn about animal rights and human rights. |

| | |
|---|---|
| **CO-3** | students will learn about environmental ethics. |
| **CO-4** | students will learn about professional ethics. |

| | **GANDHIAN STUDIES (DSE-3)** |
|---|---|
| **CO-1** | students will learn about Gandhian philosophy. |
| **CO-2** | students will learn Gandhian social philosophy. |
| **CO-3** | students will know Gandhian political and economic thought. |
| **CO-4** | students will learn the educational idea of Gandhi. |

| | DISSERTATION & PROJECT. |
|---|---|
| **Co-1** | Students will make a project on philosophy**.** |

# ISPAT AUTONOMOUS COLLEGE, ROURKELA

**Course outcome (CO) for PHYSICS HONOURS under state model (CBCS) syllabus**

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| ***CC 1. MATHEMATICAL PHYSICS -1*** | **CO1:** To understand the concept of calculus and its application in various fields of physics.<br><br>**CO2:** Knowledge of vectors and its properties with reference to vector product and scalar product.<br><br>**CO3:** Understand the different co-ordinate system such as Cartesian, cylindrical and spherical polar coordinates and their suitability.<br><br>**CO4:** Acquire the operation of gradient, divergence and curl and understand their respective physical interpretation and uses.<br><br>**CO5:** Understand Dirac-Delta function and its properties with its applications in solving many problems in physics. |
| ***CC2. MECHANICS*** | **CO1:** Understand the concept of center of Mass, its motion and comparison between center of mass frame and laboratory frame. |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | **CO2:** Understand the dynamics of Rotational Motion such as moment of Inertia, angular momentum its conservation and practical examples.<br><br>**CO3:** Understand the concept of non-inertial system or frame of reference and the laws of physics in rotating coordinate system. Idea of Coriolis force, its application.<br><br>**CO4:** Understand the different elastic constants and their relation, torsion of cylinder, bending of beam and cantilever.<br><br>**CO5:** Learn about fluid motion , surface Tension , Viscosity , Rate of flow of liquid through a capillary tube (Poiseuille's formula with correction)<br><br>**CO6:** Gain Knowledge about Gravitation, Gravitational Field & potential and the concept of central force problem, its solution, Kepler laws and Global Positioning system.<br><br>**CO7:** Learn about oscillation with emphasis on damped oscillation and forced oscillation, idea of resonance.<br><br>**CO8:** Gain idea of special theory of relativity, with reference to Michelson Morley experiment, its outcome, Lorentz |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | Transformation, its consequences, Relativistic Kinematics. |
| ***CC3: ELECTRICITY AND MAGNETISM*** | **CO1:** To acquire knowledge on electric field, electric potential, Electric flux, Gauss law and its application.<br><br>**CO2:** Concept of Magnetic field, Biot-savart law and Ampere's circuital law with application (Solenoid, Toroid etc.)<br><br>**CO3:** Understand of Dielectric properties of matter, Dielectric polarization capacitor of different types.<br><br>**CO4:** Gain idea about Magnetic properties of Matter, such as magnetization, magnetic Intensity, susceptibility, permeability etc. Hysteresis.<br><br>**CO5:** Understand the phenomenon of electromagnetic induction, Faradays laws and examples of self-Induction, mutual induction.<br><br>**CO6:** Idea of AC circuits such as LCR series and Parallel circuit.<br><br>**CO7:** Know about various network theorems such as Thevenin, Norton, Superposition, Reciprocity, maximum power transfer theorem with examples. |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| ***CC4: WAVES AND OPTICS*** | **CO1:** Understand Fermat's principle, Matrix formulation of Geometrical optics, cardinal points of an optical system.<br><br>**CO2:** Learn about wave nature of light such as Interference, diffraction with examples.<br><br>**CO3:** Gain Knowledge about Lissajous figures and their uses. |
| ***CC5: MATHEMATICAL PHYSICS -II*** | **CO1:** Gain Knowledge about expansion of a periodic function in term of Fourier series. Use of Fourier series in solving physics problem related to rectifier circuits.<br><br>**CO2:** Understand singular points of second order differential equation and power series method of solution using Frobenius Method.<br><br>**CO3:** Learn about some special function such as Legendre, Hermite, generating function and the corresponding differential equation and their solution.<br><br>**CO4:** Study of special integrals such as Beta and Gamma function with examples and idea of error function.<br><br>**CO5:** Learn about solution of partial |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | differential equation by separation of variables and Laplace equation, its use in conducting sphere and dielectric sphere in uniform electric field. |
| ***CC6: THERMAL PHYSICS.*** | **CO1:** Understand reversible and Irreversible process and know about different laws of Thermodynamics.<br><br>**CO2:** Acquire knowledge about entropy and principle of increase of entropy. Significance of unattainability of absolute zero.<br><br>**CO3:** Know about different thermodynamics potential, and idea of different phase transitions.<br><br>**CO4:** Understand Maxwell's thermodynamic Relation and their application in thermal physics.<br><br>**CO5:** Gain idea of Maxwell Boltzmann's law of distribution of velocities and its experimental verification.<br><br>**CO6:** Understand the transport phenomena such as viscosity, thermal conductivity and Diffusion of gasses.<br><br>**CO7:** Study about the behavior of Real gases, idea of critical pressure, critical |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | temperature, critical volume.<br><br>**CO8:** Know about adiabatic expansion of perfect gas, Temperature of inversion, Joule Thomson Porous plug Experiment. |
| | |
| ***CC1O: DIGITAL SYSTEM AND APPLICATIONS*** | **CO1:** Learn integrated circuit (IC), number system and Boolean algebra, idea of different types of logic gates and their uses.<br><br>**CO2:** Understand product and sum in logical expression, karnaugh map.<br><br>**CO3:** Gain knowledge about CRO, and its applications.<br><br>**CO4:** Learn about multiplexers, de-multiplexers, Adders, subtractors, IC 555 timer.<br><br>**CO5:** Acquire idea of computer organization, RAM, ROM, shift registers and counters. |
| ***CC11. QUANTUM MECHANICS AND APPLICATIONS*** | **CO1:** Understand the properties of wave functions. Interpretations of wave function , Time dependent Schrodinger equation , Gaussian wave packet<br><br>**CO2:** Learn about different types of |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | operators in quantum mechanics, and their applications.<br><br>**CO3:** Gain idea of wave packet, wave particle duality, Davisson German experiment, and complementarity.<br><br>**CO4:** Understand Heisenberg uncertainty principle, using Gamma ray microscope and electron diffraction through slit and its application.<br><br>**CO5:** Learn about the Nuclear structure and various nuclear models, idea of binding energy, semi empirical mass formula.<br><br>**CO6:** Acquire knowledge about Radioactivity, laws of radioactivity, nuclear fission and nuclear fusion, and idea of the nuclear reactor. |
| ***CC7: ANALOG SYSTEM AND APPLICATIONS*** | **CO1:** To gain knowledge about p type and n type semiconductors, PN junction diode, its use as rectifier.<br><br>**CO2:** To study transistor characteristics and Transistor biasing.<br><br>**CO3:** Understand the principle of Amplifier and the classification of amplifiers, and oscillator etc. |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | **CO4:** Understand the concept of operational amplifier and its use as inverting and non-inverting amplifier, adder, subtractor, differentiator, integrator etc. |
| ***CC8: MATHEMATICAL PHYSICS III*** | **CO1:** To study complex analysis, Cauchy Riemann equations, analytic function Cauchy's integral formula, Taylor & Laurent series. Contour integration using Cauchy's residue theorem.<br><br>**CO2:** Understand Fourier transform and gain knowledge about its applications in physics such as wave/diffusion/heat flow equations.<br><br>**CO3:** Learn about Laplace transform and its applications to solve differential Equation. Damped harmonic oscillator and simple electrical circuits. |
| | **CO1:** Learn about the inadequacy of classical physics, Such as in black body radiation, Photo electric effect, Compton effect, atomic spectra etc.<br><br>**CO2:** Understand Rutherford's alpha particle scattering experiment, and atomic model, Bohr's Atomic Model, Hydrogen spectra. |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| ***CC9: ELEMENT OF MODERN PHYSICS*** | **CO3:** Learn about time independent Schrodinger equations in 1D, 2D and 3D and solution, Its application to one dimensional problem as square well potential, Harmonic Oscillator, Quantum mechanical tunneling.<br><br>**CO4:** Understand the concept of space quantization, Electron spin, Angular momentum, Stern-Gerlach experiment LS and J-J coupling , idea of Zeeman effect and Paschen Back effect . |
| ***CC12: SOLID STATE PHYSICS*** | **CO1:** Learn about crystal structure, Miller Indices, Reciprocal lattice and x-ray diffraction.<br><br>**CO2:** Understand the lattice vibrations, phonons, Einstein & Debye's Theory of specific heat of solids.<br><br>**CO3:** Gain knowledge of magnetic properties of matter such as dia, para, fero magnetic materials, domain theory Hysteresis and superconductivity.<br><br>**CO4:** Know about dielectric properties of materials, Clausius Mossotti equation Idea of LASER, Einstein's A and B coefficients Ruby lasers, He-Ne laser. |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | **CO5:** Gain idea of energy band, Kronig-Penny model, Hall effect and experimental result of superconductivity and BCS theory. |
| ***CC13: ELECTROMAGNETIC THEORY*** | **CO1:** Know about Maxwell's equations Gauge transformations, Poynting theorem and Poynting vector, concept of the electromagnetic field energy.<br><br>**CO2:** Understand the propagation of electromagnetic waves in dielectric medium, wave impedance, idea of skin, depth plasma frequency, and propagation through ionospheres.<br><br>**CO3:** Understand Boundary conditions at a plane interface between two dielectric media , Fresnel's formula for perpendicular and parallel polarization total internal reflection , evanescent waves, metallic reflection.<br><br>**CO4:** Gain idea of polarization of electromagnetic waves, concept of double refractions, Nicol prism,Plane, circulatory and Elliptically polarized light.<br><br>**CO5:** Know about the quarter wave plate, half wave plate, Babinet's compensator, idea of optical rotation, Fresnel's theory of optical rotation, specific rotation, Polari meter. |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | |
| ***CC-14 STATISTICAL MECHANICS*** | **CO1:** Learn about microstates and macro states, Ensembles, types of ensembles, Entropy and thermodynamic probability, Maxwell Boltzmann distribution law and partition function.<br><br>**CO2:** Understand the concept of thermodynamic function of ideal gas, Gibbs paradox, law of equipartition of energy, concept of negative temperature.<br><br>**CO3:** Know about quantum statistics, Fermi Dirac Distribution law, Bose Einstein Distribution, Bosons, and Fermions.<br><br>**CO4:** understand Black body radiation, Kirchhoff's laws, Stefan Boltzmann's law, Wien's law, Rayleigh-Jeans law, ultraviolet catastrophe.<br><br>**CO5:** learn about the experimental verification of Planck's law, its derivation and Wien's law, Rayleigh-Jean law from Planck's law. |

| Discipline Specific Elective paper (DSE) | |
|---|---|
| | **CO1:** Learn the concept of |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| ***DSE-01: CLASSICAL DYNAMICS*** | generalized coordinates & velocities. Principle of virtual work, D'Alembert's principle and Lagrange's equations.<br><br>**CO2:** Know about the calculus of variations and its uses, Hamilton's equation of motion.<br><br>**CO3:** Understand central force problem and knowledge of equation of motion and nature of orbits under central force.<br><br>**CO4:** Know the basis idea of special theory of relativity with emphasis on Minkowski space, light cole, space time diagram, twin paradox.<br><br>**CO5:** Introduction of the idea of four vector concept in special theory of relativity and its application in physics such as decay of unstable particles. |
| | **CO1:** Learn about the various nuclear properties like nuclear density, binding energy, parity and magnetic moment, electric moment etc.<br><br>**CO2:** Know about Radioactivity |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| ***DSE-II NUCLEAR AND PARTICLES PHYSICS*** | with analysis of α, β, ϒ decay Geiger-Nuttall law, Neutrino hypothesis.<br><br>**CO3:** Study of various nuclear models, such as liquid drop model, Shell Model and their applications to explain magic numbers.<br><br>**CO4:** Familiarize with the principle & working of detectors for Nuclear radiations, and different particle accelerators.<br><br>**CO5:** Learn about particle physics, such as different elementary particles, their classification and properties. |
| ***DSE-III NANOMATERIALS AND APPLICATIONS*** | **CO1:** Learn about the different Nano structures in 1D, 2Dand3D along with band structure, use of Schrodinger's equations.<br><br>**CO2:** Understand the synthesis of Nano structure by different methods.<br><br>**CO3:** Learn about X-Ray diffraction scanning electron and Transmission electron microscopy.<br>**CO4:** Know about the applications of nanoparticles such as quantum |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | dots, nanowires, thin films etc. |
| **PRACTICAL TOPICS** | |
| ***PRACTICALS OF CORE COURSES LIKE :*** **MECHANICS, ELECTRICITY AND MAGNETISM, WAVES AND OPTICS, THERMAL PHYSICS, ANALOG SYSTEM AND APPLICATION, MODERN PHYSICS, DIGITAL SYSTEM AND APPLIACTION, SOLID STATE PHYSICS, QUANTUM MECHANICS, ELECTROMAGNETIC THEORY.** | **CO1:** Students learn different practical experiments based on the topics covered in the respective theory classes.<br><br>**CO2:** Students perform the practicals, analyse the results and know different experimental techniques as experiments carried out by students help them to understand the underlying concept/principle involved with it. |
| ***PRACTICALS BASED ON COMPUTATION AND PROGRAMMING USED IN TOPICS LIKE MATHEMATICAL PHYSICS, QUANTUM MECHANICS AND STATISTICAL MECHANICS.*** | **CO1:** Learn about the basics of scientific computing, error Analysis, and writing of algorithm.<br><br>**CO2:** Know about C and C++ programming and their applications.<br><br>**CO3:** Understand the numerical computation software SCILAB and numerical methods.<br><br>**CO4:** Use of SCILAB to solve second order differential |

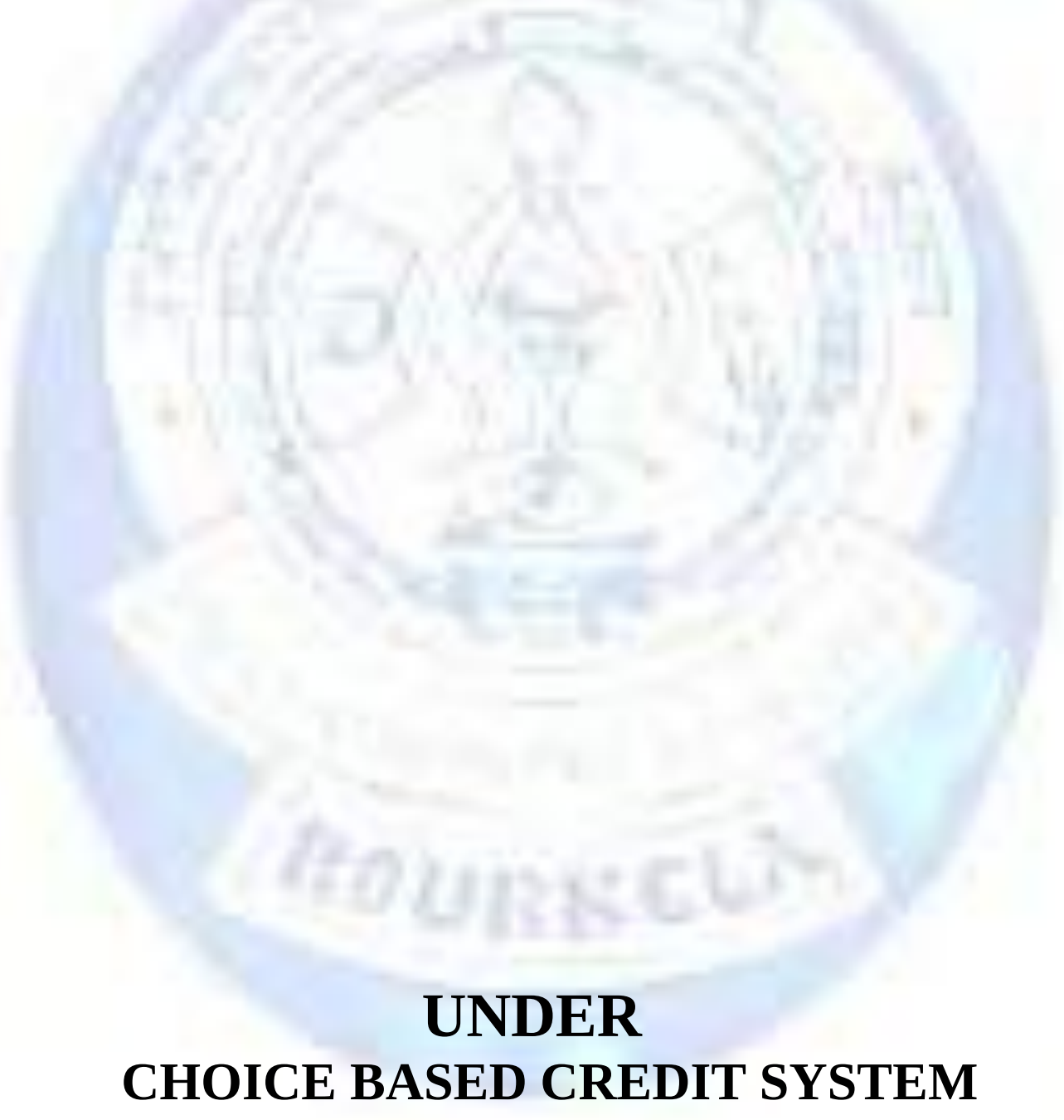
| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | equations used in physics.<br><br>**CO5:** Plotting of graphs of the topics covered in statistical mechanics laboratory work using C/C++/SCILAB. |
| ***PROGRAMME SPECIFIC OUTCOMES (PSO)*** | **PSO1:** As physics is essentially a subject which from ancient times has been involved to explain natural phenomena with theoretical and experimental techniques, the students of the department are oriented to create an atmosphere of learning the fundamentals ideas behind various phenomena ( both theory and practical).<br><br>**PSO2:** The various theories or proofs encountered in different topics of physics involves mathematical steps (simple and rigorous). Hence the topic mathematical physics included in the three year degree course helps the student to get acquainted with different mathematical techniques which increase their skills in solving problems and improve their understanding of various complex theories. |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | **PSO3:** Students learn to perform various types of numerical calculations and use of C/C++/SCILAB help them to solve problems on different topics in physics.<br><br>**PSO4:** Students of the department enhance their laboratory skills enabling them to perform experiments, make measurements and analyse the results independently thereby can draw valid conclusions. |
| ***PROGRAMME OUTCOMES*** | **After successful completion of the three year degree course in physics the students are able to**<br><br>**PO1:** Acquire knowledge in various topics of physics through theory and practicals.<br><br>**PO2:** Analyse and think independently of various existing/upcoming theories or ideas in physics.<br><br>**PO3:** Solve numerical methods or handle computational physics in future when they pursue carrier in physics. |

| CORE COURSES | COURSE OUTCOMES |
|---|---|
| | **PO4:** Solve problems of interest to physicist (both seen and unseen problems) having the mathematical expertise gained through the course.<br><br>**PO5:** Participate in innovative research & teaching thereby contributing to the development of society and instill scientific temper among people.<br><br>**PO6:** Handle sophisticated instruments /equipments due to their experimental skills and prepare themselves for cutting edge research activity both in theoretical and experimental groups. |

# SYLLABUS FOR UNDERGRADUATE COURSE IN ZOOLOGY

## (Bachelor of Science Examination)



# UNDER

## CHOICE BASED CREDIT SYSTEM

# VISION

**To empower and encourage students to take responsibility for their present and future learning by developing their academic, interpersonal, intrapersonal, vocational and instrumental skills in the Biological Science.**

# MISSION

- **To listen to one another and see the world from different perspectives.**
- **To Recognize how biological differences Kingdom, phylum,class,order,genus , species shape morphology and behavior of an organism.**
- **To Conduct research with students, educators and school communities to generate new knowledge and strategies that contribute to the field.**
- **To Critically analyze and thoughtfully engage in conversations around current educational policies that impact teaching and learning process in classrooms.**
- **To Teach and lead in a wide range of local, state, regional, national, and international development of biological strategies.**
- **To Contribute significantly to Higher Education through Teaching, Learning, Research and Extension in world.**

# Programme Educational Outcome

| PEO NO | PO STATEMENTS:<br>On successful completion of this program ,students will be able to - | |
|---|---|---|
| PEO–1 | This program is one of the fundamental unit of basic sciences studied at undergraduate level to learn and know about different biological systems, their coordination and control as well as evolution, behavior and biological roles of the animals in the ecosystem. | |
| PEO–2 | This program make students able to qualitatively and quantitatively analyze evolutionary parameters using various methods of bioinformatics and computational tools used in modern sciences that provide them with opportunities to explore different career avenues | |
| PEO–3 | Practical and theoretical skills gained in this program will be helpful to serve in industries or may opt for establishing their own industrial unit or in designing different public health strategies for social welfare. | |
| PEO–4 | This program has been designed to provide in-depth knowledge of applied subject ensuring the inculcation of employment skills so that students can make a career and become an entrepreneur in diverse fields. | |

# Programme Specific Outcome

| PSO NO | PSO STATEMENTS:<br>On successful completion of this program ,students will be able to - | |
|---|---|---|
| PSO–1 | Understand distribution or inheritance of different traits and diseases among populations, their ethnicity and correlate with contemporary and modern techniques like genomics, metagenomics, genome editing and molecular diagnostic tools. | |
| PSO–2 | Acquire practical skills in biotechnology, biostatistics,bioinformatics and molecular biology can be used to pursue career as a scientist in drug development industry in India or abroad. | |
| PSO–3 | Identify the relationship or synchronization between structure and function at all levels: molecular, cellular, and evolution based on their morphological, anatomical and systemic organization that provide students professional advantages in teaching, research and taxonomist jobs in various government organizations. | |
| PSO–4 | Acquired skills in diagnostic, testing, haematology, histopathology, staining procedures etc. used in clinical and research laboratories will provide them opportunity to work in diagnostic or research laboratory, Animal Behaviourist, Conservationist, Wildlife Biologist, Wildlife Educator, Zoology faculty, Forensic experts etc. | |

| Course Structure of U.G. Zoology Honours | | | | |
|---|---|---|---|---|
| **Semester** | **Course** | **Course Name** | **Credit** | **Total marks** |
| Semester-I | AECC I | AECC I | 4 | 100 |
| | Core I (Theory) | Non-chordates I: Protista to Pseudocoelomates | 4 | 75 |
| | Core I (Practical) | Non-chordates I: Protista to Pseudocoelomates | 2 | 25 |
| | Core II (Theory) | Principles of Ecology | 4 | 75 |
| | Core II (Practical) | Principles of Ecology | 2 | 25 |
| | GE 1 (Theory) | GE 1 (Theory) | 4 | 75 |
| | GE I (Practical) | GE I (Practical) | 2 | 25 |
| Semester-II | AECC 2 | AECC 2 | 4 | 100 |
| | Core III (Theory) | Non chordates II: Coelomates | 4 | 75 |
| | Core III (Practical) | Non chordates II: Coelomates | 2 | 25 |
| | Core IV (Theory) | Cell biology | 4 | 75 |
| | Core IV (Practical) | Cell biology | 2 | 25 |
| | GE II (Theory) | GE II (Theory) | 4 | 75 |
| | GE II (Practical) | GE II (Practical) | 2 | 25 |
| Semester-III | Core V (Theory) | Diversity of Chordates | 4 | 75 |
| | Core V (Practical) | Diversity of Chordates | 2 | 25 |
| | Core VI (Theory) | Physiology: Controlling and Coordinating systems | 4 | 75 |
| | Core VI (Practical) | Physiology: Controlling and Coordinating systems | 2 | 25 |
| | Core VII (Theory) | Fundamentals of Biochemistry and Microbiology | 4 | 75 |
| | Core VII (Practical) | Fundamentals of Biochemistry and microbiology | 2 | 25 |
| | SEC 1 | SEC 1 | 4 | 100 |
| | GE III (Theory) | GE III (Theory) | 4 | 75 |

| | | | | |
|---|---|---|---|---|
| | GE III (Practical) | GE III (Practical) | 2 | 25 |
| Semester-IV | Core VIII (Theory) | Comparative anatomy of Vertebrates | 4 | 75 |
| | Core VIII (Practical) | Comparative anatomy of Vertebrates | 2 | 25 |
| | Core IX (Theory) | Physiology: Life Sustaining Systems | 4 | 75 |
| | Core IX (Practical) | Physiology: Life Sustaining Systems | 2 | 25 |
| | Core X (Theory) | Biochemistry of Metabolic Processes | 4 | 75 |
| | Core X (Practical) | Biochemistry of Metabolic Processes | 2 | 25 |
| | SEC 2 | SEC 2 | 4 | 100 |
| | GE IV (Theory) | GE IV (Theory) | 4 | 75 |
| | GE IV (Practical) | GE IV (Practical) | 2 | 25 |
| Semester-V | Core XI (Theory) | Molecular Biology | 4 | 75 |
| | Core XI (Practical) | Molecular Biology | 2 | 25 |
| | Core XII (Theory) | Principles of Genetics | 4 | 75 |
| | Core XII (Practical) | Principles of Genetics | 2 | 25 |
| | DSE I (Theory) | DSE 1 | 4 | 75 |
| | DSE I (Practical) | DSE 1 | 2 | 25 |
| | DSE II (Theory) | DSE II | 4 | 75 |
| | DSE II (Practical) | DSE II | 2 | 25 |
| Semester- VI | Core XIII (Theory) | Developmental Biology | 4 | 75 |
| | Core XIII (Practical) | Developmental Biology | 2 | 25 |
| | Core XIV (Theory) | Evolutionary Biology | 4 | 75 |
| | Core XIV (Practical) | Evolutionary Biology | 2 | 25 |

| | | | | |
|---|---|---|---|---|
| | DSE III (Theory) | DSE III | 4 | 75 |
| | DSE III (Practical) | DSE III | 2 | 25 |
| | DSE IV (Theory with Practical /Project) | Project/ Economic Zoology | 6 | 100 |
| | | Total | **148** | **2600** |

**ZOOLOGY**

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | CORE-I | NON-CHORDATES I: PROTISTA TO PSEUDOCOELOMATES | 6 |

| CO NO | CO STATEMENTS: On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Acquire knowledge about general characteristics , classification , locomotion and reproduction in protista along with their life cycle and pathogenicity. They will also have an idea about canal system and spicules present in phylum porifera with their general characteristics and classification. | |
| CO–2 | Study about general characteristics and classification of coelenterates, corals and coral reefs and ctenophore along with their evolutionary significance | |
| CO–3 | Brief understanding about general characteristics and classification of phylum platyhelminthes alongwith their lifecycle and evolutionary significance. | |
| CO–4 | Brief understanding about general characteristics ,classification , lifecycle and evolutionary significance of phylum nemathelminthes alongwith parasitic adaptions in helminthes. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | CORE-II | Principles of Ecology | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Acquire basic knowledge about Ecosystem, Types of Ecosystem , food chain , food web, Bio-geochemical cycle and importance of conservation and management of wildlife in Ecosystem. | |
| CO–2 | Learn about basic attributes of Population, Its growth patterns, interactions and regulations in ecosystem. | |
| CO–3 | Understand characteristics of community and Ecological Succession with different theories pertaining to climax community. | |
| CO–4 | Apply methods of Biometry in sampling process , graphical representation of Data , interpretation of Data and in formulation and testing of Hypothesis in biology. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | CORE-III | **Non- Chordates II: Coelomates** | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Learn about General characteristics, classification, Metamerism and method of excretion in phylum Annelida with evolution of coelom. | |
| CO–2 | Know about General characteristics, classification, vision respiration and metamorphosis in phylum Arthropoda with basic idea about Social life in Honey bees and Termites. It also provide knowledge about general characteristics and evolutionary significance of phylum Onychophora. | |
| CO–3 | Understand General characteristics , classification , Respiration , Torsion and Detorsion process of phylum Mollusca with evolutionary significance of its Trochophore Larva. | |
| CO–4 | Know about General characteristics , classification, Water vascular System and Larval forms of phylum Echinodermata and its affinities with Chordates. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | CORE-IV | CELL BIOLOGY | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Analyse basic concepts of cell with an idea about Virus, viroids, Mycoplasma and Prions. This also explains about various models of plasma membrane and different methods of transport across it. | |
| CO–2 | Understand structural and functional aspects of Cytoskeleton and Endomembrane System such as Endoplasmic Reticulum, Golgi apparatus , Lysosomes in cell. | |
| CO–3 | Know structure ,Semi Autonomous nature, Endosymbiotic Hypothesis , chemiosmotic Hypothesis of mitochondria with mitochondrial respiratory chain. It also explain structure and function of peroxisomes in cell. | |
| CO–4 | Learn structural and functional aspects of Nucleus , Nucleolus, chromosome and cell division and its regulations with basic idea about role of GPCR and c AMP. | |

| SEMESTER | PAPER | SUBJECT | CREDITS |
|---|---|---|---|
| III | CORE-V | **Diversity and distribution of Chordates** | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Analyse General characteristics, classification, origin of Chordates and protochordates with their different larval forms and retrogressive metamorphosis in Urochordates. | |
| CO–2 | Understand General characteristics, classification, pattern of migration, parental care and Evolutionary significance of Agnatha , Pisces and Amphibia in Chordates. | |
| CO–3 | Compare General characteristics and classification of Reptiles and Birds with learning of special features such as Biting mechanism in snakes, Affinities of Sphenodon, Archaeopteryx as connective link, Flight adaptation and Migration in Birds. | |
| CO–4 | Learn General characteristics and classification of Mammals in different Zoogeographical realms with reference to their Locomotory appendages and different theories such as Plate tectonic and Continental Drift theory pertaining to its distribution. | |

| | | | |
|---|---|---|---|
| III | CORE-VI | **Physiology: Controlling and Coordinating Systems** | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Analyse Structure , Location ,Classification and Functions of Epithelial Tissue , Connective Tissue , Muscular Tissue , Nervous tissue , Bones and Cartilage with process of Ossification, Bone Growth and resorption. | |
| CO–2 | Understand Structure and Types of Muscles with mechanism of molecular and chemical basis of Muscle contraction and Neurons with Origin of Action potential across nerve fibres and formation of types of synapses , mechanism of synaptic transmission and Neuromuscular Junction. They will also have an idea of Reflex Action and Physiology of vision and hearing in man. | |
| CO–3 | Compare Histology, physiology and Methods of Contraception in male and female reproductive system with basic idea about Hypothalamus –Pituitary and Gonadal Axis , Ovarian Cycle and Placental hormones. | |
| CO–4 | Learn Histology, Location, Secretion , Mechanism of Hormone action and Function of different Hormones secreted by different endocrine glands in vertebrates sucha as Hypothalamus, Pituitary, Thyroid , Parathyroid , Pancreas , Adrenal in vertebrates. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | CORE-VII | **Fundamentals of Biochemistry and microbiology** | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Analyse Structure and Biological importance of Monosaccharides, Disaccharides , Polysaccharides of Carbohydrates and Saturated and unsaturated fatty acids, Triacylglycerol, phospholipids, Glycolipids and steroids of Lipids. | |
| CO–2 | Understand Structure , classification , properties and importance of Amino acids , immunoglobulins and Proteins with their level of organization , Denaturation and renatuaration state. | |
| CO–3 | Compare Structure and types of DNA and RNA with basic idea about denaturation and renaturation , hypo-hyperchromaticity and complementarity of DNA. | |
| CO–4 | Learn Nomenclature , classification and mechanism of action of Enzymes with derivation of Michaelis – menten Equation, concept of Km and Vmax, Lineweaver Burk plot Allosteric enzyme, Enzyme inhibition and regulation of Enzyme action. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | CORE-VIII | Comparative Anatomy of Vertebrates | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Analyse Structure , functions and derivatives of Integument , Axial and Appendicular Skeleton , Jaw suspensorium , Visceral Arches in vertebrates. | |
| CO–2 | Understand Structure,Types and function of Digestive , Respiratory and Accessory respiratory organs in vertebrates. | |
| CO–3 | Compare Structure , function and evolution of circulatory , urinogenital system and Mammalian uterus in vertebrates. | |
| CO–4 | Learn comparative account of Nervous system and Sense organs in vertebrates. | |

| | | | |
|---|---|---|---|
| IV | CORE-IX | Physiology: Life Sustaining Systems | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Learn about structural organization of alimentary canal,Mechanical and chemical Digestion of Food , Absorption of food and hormonal control of secretion of enzymes in Gastro –intestinal tract. | |
| CO–2 | Understand structure of respiratory system, Mechanism of Respiration , Respiratory volumes and capacities , Transport of Oxygen and Carbon Dioxide in Blood , Respiratory Pigments , Dissociation curves and factors influencing it , Carbon monoxide Poisioning and Control of Respiration in man. | |
| CO–3 | Compare Structure , function , mechanism of Urine formation and regulation of water balance and acid – base in Kidney with the study of structure , components and functions of Blood with knowledge of Haemoglobin , Haemostasis , Haemopoiesis , Mechanism of blood clotting system, Blood Groups , Rh Factor , ABO and MN system. | |
| CO–4 | Analyse Structure ,working of Mammalian Heart with origin and conduction of cardiac impulses ,Cardiac cycle, Cardiac output and its regulation, Frank starling Law ,Nervous and chemical regulation of Heart rate , Electrocardiogram , Blood pressure and its regulation | |

| | | | |
|---|---|---|---|
| IV | CORE-X | Biochemistry of Metabolic Processes | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Learn basic idea about Metabolism such as Catabolism vs Anabolism, Stages of catabolism, Compartmentalization of metabolic pathways, Shuttle systems and membrane transporters; ATP as "Energy Currency of cell"; coupled reactions; Use of reducing equivalents and cofactors; Intermediary metabolism and regulatory mechanisms. | |
| CO–2 | Understand metabolism of Carbohydrates through study of reactions and regulation of glycolysis, Citric acid cycle, Phosphate pentose pathway, Gluconeogenesis, Glycogenolysis and Glycogenesis in cell. | |
| CO–3 | Compare metabolism of Lipids through study of β-oxidation and omega -oxidation of saturated fatty acids with even and odd number ofcarbon atoms; Biosynthesis of palmitic acid; Ketogenesis and protein metabolism by Catabolism of amino acids: Transamination, Deamination, Urea cycle; Fate of C-skeleton ofGlucogenic and Ketogenic amino acids in cell. | |
| CO–4 | Analyse Redox systems; Review of mitochondrial respiratory chain, Inhibitors and un-couplers of Electron Transport System in cell. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | CORE-XI | MOLECULAR BIOLOGY | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Analyse Salient features of DNA and RNA, Watson and Crick model of DNA, cot curves, denaturation and renaturation of DNA, Mechanism of DNA Replication in prokaryotes and eukaryotes, RNA priming, replication of telomeres, Pyrimidine dimerization and mismatch repair | |
| CO–2 | Understand Mechanism of transcription and translation in prokaryotes and eukaryotes, and their regulations with Inhibitors of protein synthesis and Genetic code. | |
| CO–3 | Compare Structure of Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing process in cell. | |
| CO–4 | Learn Principles of transcriptional regulation in prokaryotes from lac operon and trp operon; Transcription regulation in eukaryotes with process of Gene silencing and RNA interference. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | CORE-XII | Principles of Genetics | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Analyse Principles of inheritance, Incomplete dominance , co-dominance, Multiple alleles, Lethalalleles, Epistasis, Linkage and Molecular mechanisms of crossing over including models of recombination, Recombination frequency as a measure of linkage intensity, Two factor and three factor crosses, Interference and coincidence and Somatic cell hybridization. | |
| CO–2 | Understand Types of gene mutations and chromosomal aberrations, Molecular basis of mutations in relation to UV light and chemical mutagens; Detection of mutations: CLB method and attached X method. | |
| CO–3 | Compare Chromosomal mechanisms of sex determination in *Drosophila* and Man; Criteria for extra- chromosomal inheritance, Antibiotic resistance in *Chlamydomonas*, Mitochondrial mutationsin *Saccharomyces*, Infective heredity in *Paramecium* and Maternal effects. | |
| CO–4 | Learn process of recombination through Conjugation, Transformation, Transduction in Bacteria with Transposons in bacteria, human, Ac-Ds elements in maize and P elements in Drosophila. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | CORE-XIII | DEVELOPMENTAL BIOLOGY | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Analyse Historical perspective and basic concepts of development, Cell-Cell interaction, Pattern formation, Differentiation and growth, Differential gene expression, Cytoplasmic determinants and asymmetric cell division with elaborate learning of Gametogenesis, Spermatogenesis, Oogenesis and Fertilization in vertebrates. | |
| CO–2 | Recognise Planes and patterns of cleavage; Types of Blastula; Fate maps ; Early development of frog and chick with Embryonic induction and organizers. | |
| CO–3 | Understand Fate of Germ Layers; Extra-embryonic membranes in birds; Implantation of embryo , Placenta and its types in human . | |
| CO–4 | Learn about Changes, hormonal regulations in amphibians and insects during metamorphosis; different modes of Regeneration; Ageing ; Agents of teratogenesis and their effects on embryonic development; In vitro fertilization, Stem cell and Amniocentesis. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | CORE-XIV | EVOLUTIONARY BIOLOGY | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Analyse Life's Beginnings : Chemogeny, RNA world, Biogeny, Evolutionary concept: Lamarckism, Darwinism, Neo-Darwinism. Evidences of Evolution from types of Fossil record ,Sources of variations, types and theirrole in evolution , types of extinction with detailed example of K-T extinction. | |
| CO–2 | Evaluate Population genetics by using Hardy-Weinberg Law ;concept of fitness and selection coefficient of natural selection, Mechanism of Genetic Drift with founder's and bottleneck phenomenon; Role of Migration and Mutation in evolution. | |
| CO–3 | Understand Product of evolution: Micro evolutionary changes ,inter-population variations, clines, races, Species concept, modes of speciation—allopatric, sympatric, Parapatric ,Adaptive radiation. | |
| CO–4 | Learn about Origin and evolution of man from phylogeny of *Dryopithecus* leading to *Homo sapiens* by molecular analysis with construction and interpretation of Phylogenetic tree done by Multiple sequence alignment. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | DSE -I | ANIMAL BEHAVIOUR AND CHRONOBIOLOGY | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Learn about Origin and history of Ethology; Brief profiles of Karl von Frisch, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen; Behaviour as a basis of evolution with Instinct, Stimulus filtering, Sign stimuli and Code breakers in animals. | |
| CO–2 | Analyse Stereotyped Behaviours (Orientation, Reflexes); Individual behavioural patterns- Instinct vs. Learnt Behaviour; Associative learning - classical and operant conditioning, Habituation and Imprinting behavior in animals. | |
| CO–3 | Understand Social Behaviour , Communication ,Altruism , society of Honey bee ,Sexual Behaviour and Sexual conflict in parental care in animals. | |
| CO–4 | Learn about Historical developments in chronobiology; Types and characteristics of biological rhythms: Short- and Long-term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms; Circannual rhythms and Role of melatonin in animal behaviour. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | DSE -II | IMMUNOLOGY | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Learn about Early theories of Immunology, Cells and organs of the Immune system. Anatomical barriers, Inflammation innate immunity, Adaptive immunity ,Passive: Artificial and natural Immunity, Active: Artificial and natural Immunity, Immune dysfunctions with reference to Rheumatoid Arthritis and tolerance, AIDS. | |
| CO–2 | Analyse Antigenicity and immunogenicity, Adjuvants and haptens, B and T-Cell epitopes, Immunoglobulins: Structure and functions of different classes of immunoglobulins, Antigen antibody interactions, Immunoassays (ELISA-Direct, Indirect, Competitive, Sandwich and RIA). | |
| CO–3 | Understand Structure and functions of MHC molecules. Endogenous and exogenous pathways of antigen processing and presentation; Cytokines -Properties and functions of cytokines,Complement System -Components and pathways of complement activation. | |
| CO–4 | Explain Gell and Coombs' classification of hypersensitivities ,Vaccines and Advances in vaccine production. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | DSE –III | FISH AND FISHERIES | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Learn about Systematic classification of native/exotic fishes, Types of fins and their modification; Locomotion in fishes; Hydrodynamics; Types and Use of scales in classification and determination of age of fish; Gills and gas exchange; Swim bladder; Reproductive strategies ;Electric organs; Bioluminescence; Mechanoreceptors; Schooling; Migration. | |
| CO–2 | Analyse Inland fisheries; Marine fisheries; Environmental factors influencing the seasonal variation in fish; Fishing crafts and Gears; Depletion of Fisheries resources; Fisheries laws and regulations. | |
| CO–3 | Understand Sustainable aquaculture; Extensive, semi-intensive and intensive culture of fish; Polyculture; Composite fish culture; brood stock management; Induced breeding of fish;Preparation and maintenance of fish aquarium. Factors affecting aquaculture. | |
| CO–4 | Recognise Fish diseases, Processingof harvested fish, Fishery byproducts; Transgenic fish, zebrafish as a model organism in research. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | DSE –IV | PROJECT WORK | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | know about identifying and classifying animals will provide students professional advantages in teaching, research and taxonomist jobs in various government organizations; including Zoological Survey of India and National Parks/Sanctuaries. | |
| CO–2 | Inculcate skills involved in rearing fish, bees and silk moth which would help them in starting their own ventures and generating self employment making them successful entrepreneurs. | |
| CO–3 | Acquire skills in diagnostic, testing, haematology, histopathology, staining procedures etc. used in clinical and research laboratories will provide them opportunity to work in diagnostic or research laboratory. | |
| CO–4 | Use the evidence of comparative biology to explain how the theory of evolution offers scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped animal morphology, physiology, life history, and behavior. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | GE-II | AQUATIC BIOLOGY | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Learn about Aquatic biomes: Freshwater ecosystem (lakes, wetlands,Streams and rivers), estuaries, intertidal zones, oceanic pelagic zone, marine benthic zone andcoral reefs | |
| CO–2 | Recognise Origin and classification of Lake, Lake morphometry, Physico–chemical Characteristics: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity; dissolved gases , Nutrient Cycles in Lakes-Nitrogen, Sulphur and Phosphorous , Different stages of stream development, Physico-chemicalenvironment, Adaptation of hill-stream fishes. | |
| CO–3 | Understand Salinity and density of Sea water, Continental shelf, Adaptations of deep sea organisms, Coral reefs and Sea weeds. | |
| CO–4 | Recognise Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills, Eutrophication, Management and conservation, Sewage treatment , Water quality assessment- BOD and COD. | |

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | GE-IV | CELL AND MOLECULAR BIOLOGY. | 6 |

| CO NO | CO STATEMENTS:<br>On successful completion of this course ,students will be able to - | |
|---|---|---|
| CO–1 | Learn about Prokaryotic and Eukaryotic cells, Various models of plasma membrane; Transport across Membranes,Endoplasmic Reticulum; Golgi apparatus; Lysosomes ,mitochondria in cell. | |
| CO–2 | Recognise Structure of nucleus; Mitosis, Meiosis, Cell cycle and its regulation in cell. | |
| CO–3 | Understand Watson and Crick model of DNA, Structure of RNA,tRNA and Mechanism of DNA Replication in prokaryotes and eukaryotes. | |
| CO–4 | Explain Mechanism of transcription in prokaryotes and Eukaryotes, Process of protein synthesis in prokaryotes and Eukaryotes. | |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**

**POLITICAL SCIENCE**

Course Outcome

Credit-6

**Core– I (UNDERSTANDING POLITICAL THEORY)**

**After completing this course the students will able to understand:**

| | |
|---|---|
| **CO1** | Key concepts Political Theory such as liberal, Marxist, Anarchist and Conservative |
| **CO2** | Contemporary perspectives in political theory such as feminist, modernist and postmodernist |
| **CO3** | Liberal's and Marxist views on democracy and procedural democracy and its criticism. |
| **CO4** | Deliberative democracy and the role of participation and representation in it. |
| | |

**Core–II (CONSTITUTIONAL GOVERNMENT AND DEMOCRACY IN INDIA)**

**After completing this course the students will able to understand:**

| | |
|---|---|
| **CO1** | The philosophy of Indian Constitution. |
| **CO2** | The organs of government. |
| **CO3** | Federalism and centre-state relationship. |
| **CO4** | Decentralization of power in India, role of PRIs and urban local self government. |
| | |

**Core–III (POLITICAL THEORY-CONCEPTS AND DEBATES)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Understand the Negative freedom: Liberty and Positive freedom: Freedom, Emancipation and Development, Realize and comprehend Formal Equality: Equality of opportunity, Political equality, Egalitarianism. |
| **CO2** | Evaluate Procedural Justice, Distributive Justice and Global Justice. |
| **CO3** | Understand Natural Rights, Moral and Legal Rights, three generations of Rights and Rights and Obligations. |
| **CO4** | Understand the grounds of political obligation, cultural relativism and multi culturalism. |
| | |

**Core–IV (POLITICAL PROCESS IN INDIA)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Understand Indian political parties and the party system, the Determinants of voting behavior and the functions of election commission in India. |
| **CO2** | Understand the causes of regionalism. |
| **CO3** | Understand the outcomes of Regional aspirations. |
| **CO4** | Caste and Politics in India. |
| **CO5** | Evaluate The changing nature of the Indian State. |

**Core–V (INTRODUCTION TO COMPARATIVE GOVERNMENT AND POLITICS)**

**After completing this course the student will able to understand:**

| | |
|---|---|
| **CO1** | the key concepts of comparative politics. |
| **CO2** | the meaning and development of capitalism and the features of globalization. |
| **CO3** | Colonialism and decolonialism as well as communism. |
| **CO4** | Compare the constitution of USA and China and the various political institutions. |

**Core–VI (Introduction to Public Administration)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Acquire the knowledge of Public administration as a discipline. |
| **CO2** | Understand the Theoretical perspectives and management theories. |
| **CO3** | Understand the Neo-Classical theories. |
| **CO4** | Analyse the effective role of Public policy and evaluate the Major approaches in public administration and Rational choice theory. |
| | |

**Core–VII (PERSPECTIVES ON INTERNATIONAL RELATIONS)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Understand basic intellectual stool of Studying International relations. |
| **CO2** | Understand Classical realism and Neo-Realism &Liberalism and Neo-liberalism. Marxist approaches, Feminist perspectives, Eurocentricism and Perspectives from the global south. |
| **CO3** | Understand World War–I, Significance of the Bolshevik Revolution, Rise of Fascism and World War–II. |
| **CO4** | Understand Cold War, Emergence of the third World, collapse of the USSR, post cold war. |
| | |

**Core – VIII (POLITICAL PROCESSES AND INSTITUTIONS IN COMPARATIVE PERSPECTIVE)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Understand approaches to studying comparative politics. |
| **CO2** | Understand electoral system and Party system. |
| **CO3** | Understand evolution of nation state in West Europe and post colonial debates of nation state. |
| **CO4** | Understand democratization in post colonial society. |
| | |

**Core–IX (PUBLIC POLICY AND ADMINISTRATION IN INDIA)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Understand public policy- its meaning and characteristics. |
| **CO2** | Understand decentralization – rural and urban |
| **CO3** | Understand budget- significance and types. |
| **CO4** | Understand citizen and administration interference. |
| | |

**Core–X (GLOBAL POLITICS)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Globalization: Conceptions and Perspectives and significance of global economy |
| **CO2** | Cultural and technological dimensions of globalization. |
| **CO3** | Contemporary Global issues, Ecological issues, proliferation of Nuclear Weapons and International Terrorism. |
| **CO4** | Migration, Human Security. |

**Core–XI (WESTERN POLITICAL PHILOSOPHY)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Understand the ideas of Plato and Aristotle. |
| **CO2** | Understand the political ideas of Machiavelli and Hobbes. |
| **CO3** | Understand the political ideas of Locke and Rousseau. |
| **CO4** | Understand the political ideas of J.S.Mill and Karl Marx. |
| | |

**Core–XII (INDIAN POLITICAL THOUGHT (ANCIENT AND MEDIEVAL)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Understand the traditions of Pre-colonial Indian Political Thought. |
| **CO2** | Understand Ved Vyasa: Raja dharma and Manu: Social laws. |
| **CO3** | Understand Kautilya's Theory of State, Foreign Policy and his views on the role of King, Aggannasutta: Theory of Kingship. |
| **CO4** | Understand Abul Fazal's views on Monarchy |
| | |

**Core–XIII (CONTEMPORARY POITICAL PHILOSOPHY)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Understand the political ideas of Lenin |
| **CO2** | Understand the political ideas of Mao Zedong |
| **CO3** | Understand the political ideas of Antonio Gramsci |
| **CO4** | Understand the political ideas of John Rawls |
| | |

**Core–XIV (MODERN INDIAN POLITICAL THOUGHT)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | **Understand the political philosophy of Rammohan Roy, Pandita Ramabai, and Vivekananda** |
| **CO2** | **Understand the political philosophy of Gandhi and Ambedkar** |
| **CO3** | **Understand the political philosophy of Tagore and Savarkar** |
| **CO4** | **Understand the political philosophy of Nehru, Lohia, and J.P.Narayan** |
| | |

**DSE–I (INTRODUCTION TO HUMAN RIGHTS)**

**On completion of the course, the students will be able to:**

| | |
|---|---|
| **CO1** | Understand the concept of Human Rights and its Theory and Institutionalization. |
| **CO2** | Understand the Universal declaration of of Human Rights |
| **CO3** | Understand the rights in constitutions of South Africa and India |
| **CO4** | Understand the International Refugee Rights and International Humanitarian Law. |
| | |

**DSE -2 (DEVELOPMENT PROCESS AND SOCIAL MOVEMENTS IN CONTEMPORARY INDIA)**

**After completing this course the students will understand:**

**CO-1** Welfare State, Development and the role of Planning commission, Development in the era of Liberalization and Reforms, Development Strategy and its Impact on the Social Structure

CO-2 Industrial Development and its impact on organized and unorganized labor , Agricultural Development and Agrarian Crisis, Land Reforms and Green Revolution, Social Movements

CO-3 Social Movements: Meaning and Approaches, New Social Movements, Women's Movement, Environmental Movements, Social Movements

CO-4 Dalit Movement, Tribal Movement, Left wing Extremism: Issues and Challenges

**DSE–3 (INDIA'S FOREIGN POLICY IN A CHANGING WORLD)**

**On completion of the course, the students will be able to understand:**

| | |
|---|---|
| **CO1** | India's Foreign Policy: From a post colonial state to an aspiring global Power. |
| **CO2** | India's relations with the USA and USSR/Russia, India's engagements With China. |
| **CO3** | India in South Asia: Debating Regional Strategies. |
| **CO4** | India'snegotiatingstyleandstrategies:Trade,EnvironmentandSecurity Regimes. |

**DSE-4(**Dissertation)

After completing this course the students will get fundamental knowledge regarding the academic research process. It will enable them to experience field works in research. It will also create the interest among students regarding further academic research in future.

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

# PROGRAMME OUTCOME

**PO1**. Develop an insight into the scope and purpose of literature within the broader perspective of Humanities.
**PO2**. Critically understand a wide array of texts-British, American, and Indian among others and analyze them against their social and historical context.
**PO3**. Understanding how text inform about culture and tradition and give insight into the individual literary work
**PO4**. Develop critical writing skills suited for a profession in print and electronic media, content writing and translation.
**PO5**. Enhance research related skills for presentation of seminar and for publish in research journals or traditional academic journals.

# PROGRAMME SPECIFIC OUTCOMES

**PSO1**.Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.
**PSO2**. Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.
**PSO3**. Understand and apply the extended meaning of "English Literature" to various post-colonial and other writings in English.
**PSO4**. Ability to understand and write about different literary genres, forms, periods and movement.
**PSO5**. Ability to engage with various literary and critical concepts.
**PSO6**. Increase student ability to engage with relevant scholarly works in order to develop one's own critical views.
**PSO7**. Ability to speak and write in standard academic English.

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| I | I | This British Poetry and Drama:14th to 17th Century |

| COURSE OUTCOME | |
|---|---|
| CO1 | On completion of this course, students will able to identify major writers and their works in chronological order and point out literary trends of each historical period |
| CO2. | Learn changes in the structure of the English language from the earliest written records to the present day |
| CO3. | At the end of the course, students are expected to demonstrate a thorough understanding of diachronic changes in English from Old English to Present day English, and the ability to situate those in their socio-political contexts |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| I | II | British Poetry and Drama:17th and 18th Century |

| COURSE OUTCOME | |
|---|---|
| CO1 | Apart from the appreciation of literature, at the end of the course, a student is expected to analyze literary texts critically. |
| CO2. | Students will be able to relate Comedy of humours and Comedy of manners texts to their real-life experiences |
| CO3. | . Learn about Metaphysical poets who revolutionized the writing of poetry with their scholarly assimilation of diverse experiences expressed through complex image |
| CO4 | Learn about Ben Jonson and Dryden the world of deep emotions and intellectual perceptions, blended with profound philosophy and aesthetic sublimation. |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | AECC | SUBJECT |
|---|---|---|
| II | II | |

| COURSE OUTCOME | |
|---|---|
| CO1 | On completion of this course students will be able to enhance communication skills |
| CO2. | Will have proper understanding of the communication process and its elements |
| CO3. | . Understand and appreciate various literary writings. |
| CO4 | Understanding of the basic concepts of grammar |
| CO5 | Understand distinguish spoken and written communication |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| II | III | British Prose: 18th Century - III |

| COURSE OUTCOME | |
|---|---|
| CO1 | Development thorough knowledge of literary history, theory & criticism. |
| CO2. | enhances their understanding of a wide range of cultures & intellectual traditions |
| CO3. | Acquaint with newly evolved form of literature: The essay |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

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| SEMESTER | CORE | SUBJECT |
|---|---|---|
| II | IV | **Indian Writing in English** |

| COURSE OUTCOME | |
|---|---|
| CO1 | Acquire knowledge of Indian writing spanning all genres |
| CO2. | Interpret ideas of the past and contemporary writers |
| CO3. | Understand the impact of Indian writers through prose and poetry |
| CO4 | Illustrate the literary background |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| III | V | **British Romantic Literature** |

| COURSE OUTCOME | |
|---|---|
| CO1 | The course would help students situate authors like Blake and Wordsworth in their his topical and social contexts to better understand their texts |
| CO2. | Romantic fiction by Mary Shelley and non-fiction by Charles Lamb provide a com prehensile understanding of the age across diverse genres. |
| CO3. | From Wordsworth, Coleridge, Shelley, Byron, Keats and Austen, this course introduce students to various forms of writing during the romantic era, especially the poetry |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| III | VI | **British Literature: 19th Century** |

| COURSE OUTCOME | |
|---|---|
| CO1 | This course will introduce students to some significant texts and literary movements of the period, in the wider context of social transformation and emerging literary practices |
| CO2. | Students shall be introduced to the establishment of the novel as the dominant literary genre, the ways in which social values are encoded and contested in literary texts, and the relationship of traditional and experimental practices in poetic forms. |
| CO3. | The course aims to develop students' analytic and critical skills through a close reading of poets like Tennyson & Browning and novelists like Jane Austen and Charles Dickens |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| III | VII | **British Literature: The Early 20th Century** |

| COURSE OUTCOME | |
|---|---|
| CO1 | The students are introduced to glimpses of the incredibly complex cultural phenome- non called modernism in British literature |
| CO2. | The poems of T. S. Eliot and W. B. Y eats have been included in this course to repre sent the major trends in this paradigm shift |
| CO3. | The unfathomable recesses of the human mind can be probed in the stories of Virginia Wolf and J M Synge. |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| III | SEC 1 | |

| COURSE OUTCOME | |
|---|---|
| CO1 | To learn the fundamentals and tools of communication, to develop vital skill of communication, verbal and non verbal |
| CO2. | Attain confidence in personal, social and professional interactions |
| CO3. | Will promote writing skills using correct form of grammar . |

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**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| IV | VIII | **American Literature** |

| COURSE OUTCOME | |
|---|---|
| CO1 | This course exposes the students to American literary, cultural and political history through a wide-ranging selection of texts and critical understanding from drama, nov- el, and poetry by the great masters like Mark Twain, Fitzgerald, Poe, Tennessee Wil- liams, to iconic authors like Plath, Whitman and Robert Frost. |
| CO2. | Recognize the many facets of literature in order to have the capacity to do a thorough analysis of any piece of written |
| CO3. | Enjoy the works of literature at a variety of different levels of understanding |
| CO4. | The students' takeaway from this course is a sense of race, class and gender in the American social and cultural milieu. This course is an exposition of the American thinking mind and their ways of life |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| IV | IX | **European Classical Literature** |

| COURSE OUTCOME | |
|---|---|
| CO1 | The students would have been able to link to the historical past of the literary work, as well as relate it to the current day, if they had been given the opportunity to do so |
| CO2. | Through making use of several literary devices, a comprehension of the text may have been achieved. |
| CO3. | Students would have been exposed to the great poets and dramatists of the past, along with the canonical works of traditional European literature |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| IV | X | **Women's Writing** |

| COURSE OUTCOME | |
|---|---|
| CO1 | Students would have had an understanding of the concept of gender equality and the rights of women |
| CO2. | Students would have been aware of the seismic shifts in society that occurred as a direct result of the empowerment of women. |
| CO3. | The detrimental effects that female feticide and the exploitation of women have on society would have been brought to the attention of the students |
| CO4. | Students' understanding and comprehension of the role of women in the advancement of society would have been strengthened as a result of this unit |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| V | XI | **Modern European Drama** |

| COURSE OUTCOME | |
|---|---|
| CO1 | The students would have been able to comprehend the unique concept of absurd drama as well as the progression of the genre. |
| CO2. | Students will have gained an understanding of the sociopolitical upheavals that have taken place as well as the realistic aspects of contemporary European theatre |
| CO3. | Students would have been familiar with renowned dramatists and the realistic approach of contemporary European dramatists. |
| CO4. | Students are expected to learn the differences between dramatic theatre and epic theatre and will also learn about social values and culture through the writings of Ibsen, Brecht and Beckett. |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | CORE | SUBJECT |
|---|---|---|
| V | XII | **Indian Classical Literature** |

| COURSE OUTCOME | |
|---|---|
| CO1 | . By the time the students reached the conclusion of the course, they would have acquired information of the great works that are found in Indian classical literature.<br>. |
| CO2. | Pupils' interest in the subject matter would have been piqued by the excellent classical play of Kalidasa, Vyasa and Sudraka. |
| CO3. | . Pupils would have been instilled with the values of selflessness, passion, honesty, and tolerance via the lessons that they were taught |
| CO4. | Students would have been encouraged to do comparative research on Indian classical literature and English literature. |
| CO5. | Pupils would have been able to appreciate the depth of Indian literary tradition |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | **DSE** | SUBJECT |
|---|---|---|
| V | **I** | **Literary Theory** |

| COURSE OUTCOME | |
|---|---|
| CO1 | Understand the evolution of critical thinking down the ages |
| CO2. | Appreciate the various critical elements and their functions in a work of art. |
| CO3. | Examine the Aesthetic characteristics that make a literary work. |
| CO4. | Apply the critical skills to appreciate a literary work |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | **DSE** | SUBJECT |
|---|---|---|
| V | **II** | **World Literatures** |

| COURSE OUTCOME | |
|---|---|
| CO1 | Familiarize themselves with the works of authors such as V.S. Naipaul, Albert Camus and Alice Munroe as well as the writings of those authors. |
| CO2. | Provide a detailed interpretation of the text and highlight its most important aspects. |
| CO3. | . Enjoy the works of literature at a variety of different levels of understanding |
| CO4. | Exhibit<br>their capacity to apply the analytical frameworks to the assessment of literary works. |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | **CORE** | SUBJECT |
|---|---|---|
| VI | **XIII** | **Postcolonial Literatures** |

| COURSE OUTCOME | |
|---|---|
| CO1 | At the end of the course, students will have a better understanding of the lexicon and ideas that are unique to post-colonial literature |
| CO2. | It is expected that students will get acquainted with the evolution of post-colonial literature |
| CO3. | Students will have familiarized themselves with the most prominent theories as well as renowned authors who have contributed to the development of such ideas. |
| CO4. | Students would have had a better understanding of how the colonial power has inspired a response from the country in their desire for a literature that is uniquely theirs. . |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | **CORE** | SUBJECT |
|---|---|---|
| VI | **XIV** | **Popular Literature** |

| COURSE OUTCOME | |
|---|---|
| CO1 | Students would have the ability to distinguish between canonical literature and popular literature |
| CO2. | Students would have gained an understanding of the efficiency of the genres of literature that have a mass appeal, such as romance, fantasy/mythology, and detective fiction. |
| CO3. | Students would have had a deeper comprehension of the ways in which popular culture informs literature. . |
| CO4. | Students would have had a better understanding of how the colonial power has inspired a response from the country in their desire for a literature that is uniquely theirs. . |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | **DSE** | SUBJECT |
|---|---|---|
| VI | **III** | **Partition Literature** |

| COURSE OUTCOME | |
|---|---|
| CO1 | Students will explore significant writing on Partition Literature |
| CO2. | Emotionally connect with the loss, trauma and communalism during Partition |
| CO3. | Critically analyze the issue of colonization, nationalism, hopelessness, exile and women in the representative writings of Partition Literature |

**ISPAT AUTONOMOUS COLLEGE, ROURKELA**
**DEPARTMENT OF ENGLISH**

| SEMESTER | **DSE** | SUBJECT |
|---|---|---|
| VI | IV | **Dissertation** |

| COURSE OUTCOME | |
|---|---|
| CO1 | After completion of research project, students will attain in depth knowledge of a particular topic |
| CO2. | Students will get familiar with different research methodology and various steps involved to write a project. |
| CO3. | Project will help students to think independently and take responsibility for their own learning |
| CO4. | Various skills learned through project writing will make students confident and competent in their future career. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

## The objectives of BBA programme

**PO1:** To remember the conceptual knowledge with an integrated approach to diversified functions of management

**PO2:** To develop leadership acumen and communication skill s to become successful business leaders or mangers

**PO3:** To develop insights of business understanding to inculcate future entrepreneurs in society at large that becomes indicator of growth in economic engine

**PO4:** To develop problem solving skills through experience learning and to ensure knowledge in professional careers

**PO5:** To culture into the various areas of management i.e. Finance, HR & HRD, Marketing & Sales Promotion, Operation research & Quantitative values that to understand the application of all such in business domain

**PO6:** To develop personality, confidence and self believe to become responsible future managers

**PO7:** To recapitulate ethical feeling for self-building process

## Programme Learning outcomes (PLO)

The expected outcomes after the completion of the programme would be

**PLO1:** Management Knowledge: Acquire the adequate knowledge through principles, theory and models of business management, Accounting, Marketing, Finance, IT, Operations, Human Resources.

**PLO2:** Communication: Demonstrate the proficiency for business communication for effective professional business management

**PLO3:** Technical Knowledge: Acquire employability skills through practical exposure of IT and its usage in management.

**PLO4:** Entrepreneurial perspective: Develop entrepreneurial skills to become aentrepreneur

**PLO5** Leadership skills: Ability to develop group behaviour and lead a team to achieve the individuals, group and organisations goal

**PLO6:**Ethics: Understand the importance of ethics in business-decision making and inculcate the spirit of social responsibility

**PLO7:** Analysing the Business Problems: Analyse and comprehend the applicability of management principles in solving the complex business issues.

**PLO8:** Legal knowledge: Obtaining the legal knowledge about the business.

## Problem Specific outcomes (PSO)

**PSO1:** Acquire practical learning through summer internship, industrial visitand business plan etc.

**PSO2:** Demonstrate analytical and problem solving skills through core electives area of specialisation in Finance, HR, and Marketing to solve the business issues

**PSO3:** Understand and develop the new dimensions of knowledge through open electives to cater the need of the industry

**Abbreviation Used on (Special) Couses wise study, apart from prescribed core and other electives**

- ✓ **ACE: Ability Enhancement- Compulsory**
- ✓ **SEC: Skill Enhancement Course**
- ✓ **DSE: Discipline Specific Elective**

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
## DEPARTMENT OF BBA

# BBA

## Syllabus

## (BACHELOR OF BUSINESS ADMINISTRATION)

## *A*

## Three Years Degree

***(Professional Programme)***

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

**BACHELORS OF BUSINESS ADMINISTRATION (BBA)**

| Paper Code | Semester I | Importance |
|---|---|---|
| 101 | Environmental Science | Ability Enhancement |
| 102 | Fundamentalsof Management &Organisational Behaviour | Core Discipline |
| 103 | Statistics for Business Decisions | Core Discipline |
| 104 | Entrepreneurship Development | Elective Course-Generic/Interdisciplinary |
| | **Semester II** | |
| 201 | Business communication Language: English/MIL) | Ability Enhancement Compulsory |
| 202 | Managerial Economics | Core Discipline |
| 203 | Business Accounting | Core Discipline |
| 204 | Ethics & Corporate Social Responsibility | Elective Course-Generic/ Interdisciplinary |
| | **Semester- III** | |
| 301 | Macroeconomics Economics | Core Discipline |
| 302 | Principles of Marketing | Core Discipline |
| 303 | Management Accounting | Core Discipline |
| 304 | Production & Operations Management | Electives Course-Generic/ Interdisciplinary |
| 305 | E-Commerce | Skill Enhancement Course |
| | **Semester -IV** | |
| 401 | Business Research | Core Discipline |
| 402 | Human Resource Management | Core Discipline |
| 403 | Financial Management | Core Discipline |
| 404 | Tax Planning | Elective Course-Generic /Interdisciplinary |
| 405 | Personality Development & Communication Skills | Skills Enhancement Course |
| | **Semester - V** | |
| 501 | Quantitative Techniques for | Core Discipline |

| | | |
|---|---|---|
| | Management | |
| 502 | Legal Aspect of Business | Core Discipline |
| 503 | Electives- I (Consumer Behaviour) | Discipline Specific Elective |
| 504 | Elective- II (Personal Selling & Sales Force Management | Discipline Specific Elective |
| 505 | Dissertation & Viva (Summer Internship Project) | |
| | **Semester -VI** | |
| 601 | Business Policy & Strategy | Core Discipline |
| 602 | Financial Institution & Markets | Core Discipline |
| 603 | Elective- III(Advertisement & Brand Management) | Discipline Specific Elective |
| 604 | Elective – IV (Retail Management) | Discipline Specific Elective |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

## PapersWise Credit Ratings

| Paper Code | Semester I | Credit |
|---|---|---|
| 101 | Environmental Science | 4 |
| 102 | Fundamentals of Management & Organisational Behaviour | 4 |
| 103 | Statistics for Business Decisions | 4 |
| 104 | Entrepreneurship Development | 4 |
| | Semester II | |
| 201 | Business Communication (Language: English/MIL) | 4 |
| 202 | Managerial Economics | 4 |
| 203 | Business Accounting | 4 |
| 204 | Ethics & Corporate Social Responsibility | 4 |
| | **Semester- III** | |
| 301 | Macroeconomics Economics | 4 |
| 302 | Principles of Marketing | 4 |
| 303 | Management Accounting | 4 |
| 304 | Production & Operations Management | 4 |
| 305 | E-Commerce | 2 |
| | **Semester -IV** | |
| 401 | Business Research | 4 |
| 402 | Human Resource Management | 4 |
| 403 | Financial Management | 4 |
| 404 | Tax Planning | 4 |
| 405 | Personality Development & Communication Skills | 2 |
| | **Semester - V** | |
| 501 | Quantitative Techniques for Management | 4 |
| 502 | Legal Aspect of Business | 4 |
| 503 | Electives- I (Consumer Behaviour) | 4 |
| 504 | Elective- II (Personal Selling & Sales Force Management | 4 |
| 505 | **Dissertation &Viva (Summer Internship Project)** | 4 |
| | **Semester -VI** | |
| 601 | Business Policy & Strategy | 4 |
| 602 | Financial Institution & Markets | 4 |
| 603 | Elective- III(Advertisement & Brand Management) | 4 |
| 604 | Elective – IV (Retail Management) | 4 |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
## DEPARTMENT OF BBA

## BBA

Semester –I

| Paper Code | Semester - I |
|---|---|
| 101 | Environmental Science |
| 102 | Fundamentals of Management & Organisation Behaviour |
| 103 | Statistics for Business Decisions |
| 104 | Entrepreneurship Development |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | (101) AEC | Environmental Science | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire the basic knowledge on Environmental issue and its related importance's |
| CO-02 | Understand the types of environmental issues and its impact on business and related effect's |
| CO-03 | Develop the application welfare aspect concerning to environment to protect, prevent ecology & environment from drastic business policies at large |
| CO-04 | Analyse how green and clean environment helps for the better business policies |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | ( 102) Core | Fundamentals of Management & Organisational Behaviour | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire and equipped with basic knowledge on concepts of management and its principles |
| CO-02 | understand the basic of organisation & Pattern of its Behaviour |
| CO-03 | Develop the application through experience and cases on the subject to Inculcate the theories of management and organisation fundamentals to design effective future business related policies |
| CO-04 | Analyse and Assimilate organisation problems with better analysis and understandings |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | (103) Core | Statistics for Business Decisions | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire and equipped with the study of about central tendency and dispersion |
| CO-02 | understand the various permutation and combinations and explain probability |
| CO-03 | Develop and Evaluate the relationship between variables by correlation and regression analysis |
| CO-04 | Analyse and Evaluate Binomial, Poisson, and Normal distribution |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| I | (104) Elective | Entrepreneurship Development | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire understanding of Entrepreneurial values |
| CO-02 | understand social entrepreneurship and family entrepreneurship |
| CO-03 | Develop and Boosting up Moral of learners to create new and challenging entrepreneurs |
| CO-04 | Analyse challenges to become a successful entrepreneur in society at large |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
## DEPARTMENT OF BBA

# BBA

## SEMESTER II

| Paper Code | Semester - II |
|---|---|
| 201 | Business Communication |
| 202 | Managerial Economics |
| 203 | Business Accounting |
| 204 | Ethics & Corporate Social Responsibility |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | (201) AEC | Business Communication | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire understanding skills like effective communication, team spirit, presentation skills and corporate etiquette |
| CO-02 | understand various connotation of language |
| CO-03 | Develop and impart training and confidence for public speaking, mass communication etc. |
| CO-04 | Analyse various connotation of language, language skills apply it in formal communication |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | (202) Core | Managerial Economics | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire micro economic concepts and techniques in evaluating business decisions of firms by managers |
| CO-02 | understand alternative courses of action in micro economical point of view |
| CO-03 | Develop and impart application wise knowledge in microeconomics context to analyse the firms behaviour and other economical growths |
| CO-04 | Analyse application of economics to managerial decision making |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | (203) Core | Business Accounting | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about the preparation of preparation of financial statements |
| CO-02 | understand alternative courses of corporate reporting and its insightful analysis |
| CO-03 | Develop and impart Ind. AS in compliance with IFRS, Accounting Standards (ICAI) |
| CO-04 | Analyse application of accounting for business prediction, decoding the financial statements etc. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| II | (204) Elective | Ethics & corporate Social Responsibilities | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about the ethical issues of business |
| CO-02 | understand the benefits of ethical values in life and organisational level |
| CO-03 | Develop and impart required skills for good corporate governance |
| CO-04 | Analyse application Social Responsibility of business |

# BBA

## SEMESTER III

| Paper Code | Semester - III |
|---|---|
| 301 | Macroeconomics |
| 302 | Principles of Marketing |
| 303 | Management Accounting |
| 304 | Production & Operation Management |
| 305 | E Commerce |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | (301) Core | Macroeconomics | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about the principles of Macroeconomics and its aggregate study |
| CO-02 | Understand the determination of and linkages between major economic variables |
| CO-03 | Develop in-depth understanding of monetary and fiscal policy and aggregate behaviour of individuals |
| CO-04 | Analyse Study of Open Market |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | (302) Core | Principles of Marketing | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about the marketing fundamentals |
| CO-02 | Understand the application of marketing at organisational level and its promotion |
| CO-03 | Develop in-depth understanding market Segmentation, Targeting, Price Skimming, Positioning etc. |
| CO-04 | Analyse Policies like PLC, promotion mix, Marketing of Services etc. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | (303) Core | Management Accounting | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about the advanced cost techniques & procedures |
| CO-02 | Understand the application of the course for strategic decision making and organisation planning |
| CO-03 | Develop the concept over the various management accounting tools to optimise cost and maximise future profits etc. |
| CO-04 | Analyse financial competitiveness of the firm etc. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | (304) Elective | Production & Operations Management | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about the production and operation function at large |
| CO-02 | Understand the application of course for production planning & control |
| CO-03 | Develop the exposure of various production tools & suggested techniques for cost assessment, cost reduction & control in assembly line |
| CO-04 | Analyse production scale, aggregate planning etc. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| III | (305) SEC | E-COMMERCE | 2 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about E-Commerce |
| CO-02 | Understand the application of E-Commerce and correlativity with WWW platform & Internet. |
| CO-03 | Develop the exposure of Web Design, applications of high end computer languages like HTML, CSS etc. |
| CO-04 | Analyse Cyber Security Threats and checks etc. |

# BBA

## SEMESTER IV

| Paper Code | Semester - IV |
|---|---|
| 401 | Business Research |
| 402 | Human Resource Management |
| 403 | Financial Management |
| 404 | Tax Planning |
| 405 | Personality Development & Communication Skills |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | (401) Core | Business Research | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about research in general followed by business research |
| CO-02 | Understand the application various Research tools |
| CO-03 | Develop the exposure of Research Design |
| CO-04 | Analyse of Data through Sampling techniques |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | (402) Core | Human Resource Management | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about Management of human resources at organisational level |
| CO-02 | Understand the application of the course for team building, quality performances at work |
| CO-03 | Develop the exposure of HRD, HRP, organisational Trainings etc. |
| CO-04 | Analyse core (HR) issues like downsizing & rightsizing of jobs, job grievances and disputes, unrest, industrial disputes settle mechanism, compensation, Job Safety etc. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | (403) Core | Financial Management | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge management part of finance in personal life as well as in industry |
| CO-02 | Understand the application finance into businessfollowed by investment decisions |
| CO-03 | Develop the exposure financial aspects of corporate finance i.e. capital structure, dividend policies, leverage analysis etc. |
| CO-04 | Analyse of internal part of financial planning towards WCM, Receivables Management, Inventories Management etc. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | (404) Elective | Tax Planning | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge Tax and its ultimate benefits |
| CO-02 | Understand the application of various tax law theories like cess, exemption, Rebate etc. heads of income source, GTI, capital gain, tax evasion & avoidance, Corporate Tax Management, application of GST etc. |
| CO-03 | Develop the exposure Set-off & carry forward of losses, Tax Planning etc. |
| CO-04 | Analyse of prescribed theories of tax law |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| IV | (405) SEC | Personality Development and Communications Skills | 2 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge various personality traits |
| CO-02 | Understandingthe importance of personality building for self-growth & organisational perspectives |
| CO-03 | Develop the root issues in life i.e. self - confidence, Mnemonics, Time management, blending the level of communication, Leadership acumen etc. |
| CO-04 | Analyse of body language, inter personal communication and relationships, team building etc. |

# BBA

## SEMESTER V

| Paper Code | Semester - V |
|---|---|
| 501 | Quantitative Technique for Management |
| 502 | Legal Aspects of Business |
| 503 | Elective-I (Consumer Behaviour) |
| 504 | Elective- II (Personal Selling & Sales Force Management) |
| 505 | Dissertation & Viva (Summer Internship Projects) |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | (501) Core | Quantitative Techniques for Management | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire students with the construction of mathematical models for higher managerial decision making |
| CO-02 | Understandingthe important concepts i.e. linear programing, elementary transportation etc. |
| CO-03 | Develop the exposure about constructive mathematical models for effective business decisions. |
| CO-04 | Analyse of Network, Decision theory etc. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | (502) Core | Legal Aspect of business | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about law of contract Act, 1872 |
| CO-02 | Understandingthe importance of law resolving business disputes |
| CO-03 | Develop the knowledge by going through cases in law and its long term business applications |
| CO-04 | Analyse of consumers rights, protection act, 1986 etc. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | (503) DSE I, Marketing | Consumer Behaviour | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about various psychological traits of consumers |
| CO-02 | Understandingthe importance of the course to discover the psychological aspects of consumers by going through cases and research conducted in the marketing field |
| CO-03 | Develop the exposure on modern theory of consumer behaviour recommended for strategically business decisions |
| CO-04 | Analyse of psychographics and pattern of thoughts in consumers mind |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| V | (504) DSE-II, Marketing | Personal Selling & sales force Management | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge various tools required to be a success in the various techniques essential for sales staff management. |
| CO-02 | Understandingthe importance of personal, organisational selling |
| CO-03 | Develop the concepts of consumers buying behaviour in product market |
| CO-04 | Analyse of consumers' expectations, needs and attitudes to design effective marketing promotional strategies etc. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| Semester V | Paper Code- 505, (Compulsory) | Dissertation & Viva (Summer Internship) |
|---|---|---|

| CO NO | CO- STATEMENTS On successful completion of this course, students will able to; |
|---|---|
| **CO-1** | Acquire the technical knowledge with both academics and industry interface to elevate future managerial skill & professional expertise |
| **CO-2** | Understand the importance of the course and its practicality during the visit & work related tours etc. |
| **CO-3** | Familiarize the working environment going on in industry/Corporate level |
| **CO-4** | Analyse and representation of compiled research work during the dissertation followed by viva conducted by the panel of experts |

# BBA

## SEMESTER VI

| Paper Code | Semester - VI |
|---|---|
| 601 | Business Policy & Strategy |
| 602 | Financial Institutions & Markets |
| 603 | Elective-III (Advertisement & Brand Management) |
| 604 | Elective- IV (Retail Management) |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | (601) core | Business Policy & Strategy | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about business policies and strategies with changing world of business |
| CO-02 | Understandingthe importanceof organisations strategies from both internal and external perspectives of business |
| CO-03 | Develop the ideas about strategically Frameworks of business |
| CO-04 | Analyse of the key issues like culture and strategic leadership etc. |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | (602) core | Financial Institutions and Markets | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about different aspects and components of financial markets & institutions |
| CO-02 | Understandingthe role & importance of Financial Markets |
| CO-03 | Familiarize with the functions of secondary markets, Bulls & Bears in the stock markets, Major instruments traded in the stock markets etc. |
| CO-04 | Analyse and depth study of money markets & Debt Markets in India |

# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | (603) DSE III, Marketing | Advertising & Brand Management | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge to students about successful advertising programme |
| CO-02 | Understandingthe issues in brand management, faced by firms operating in competitive markets |
| CO-03 | Familiarize with Media planning & Scheduling, objectives to task methods, factors influencing media planning |
| CO-04 | Analyse of management of sales promotion, branding challenges & opportunities, brand hierarchy, brand personality, image, integrating advertising with related cases |

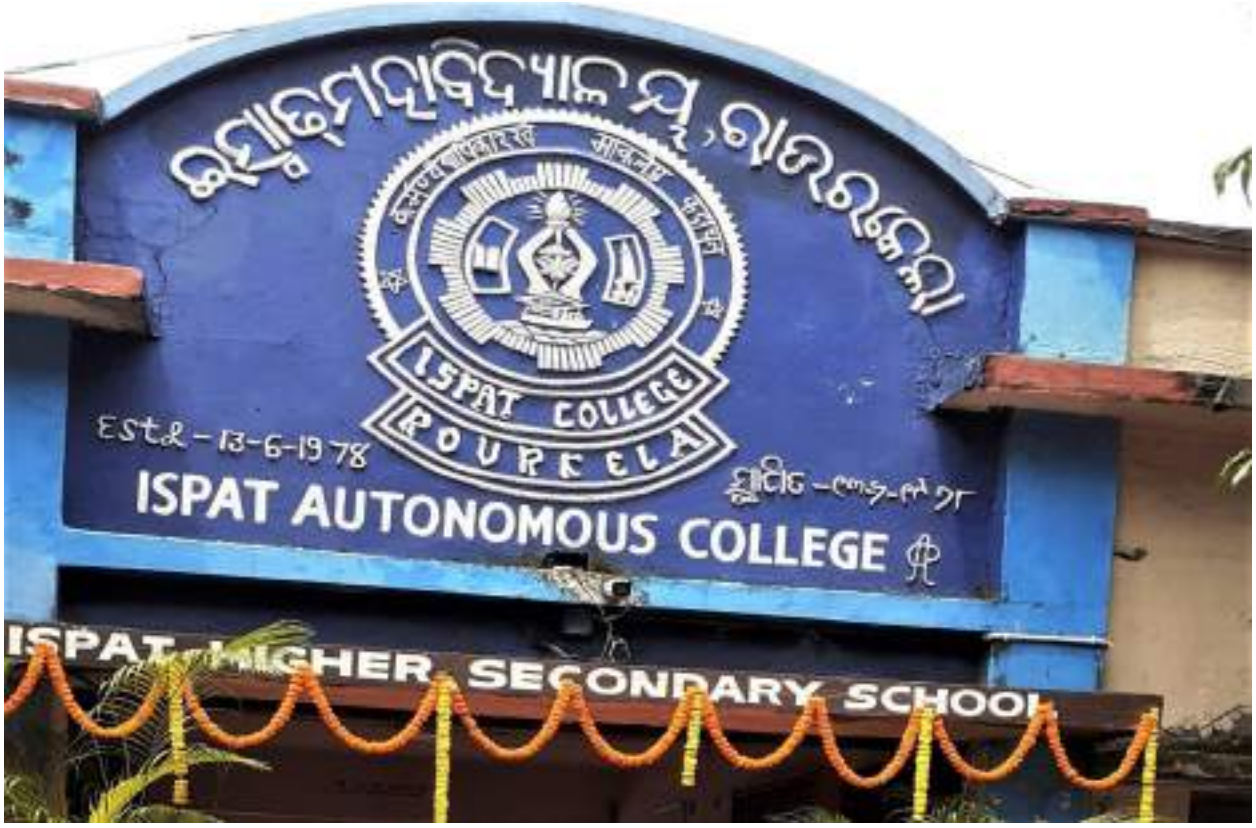
# ISPAT (AUTONOMOUS) COLLEGE, ROURKELA
# DEPARTMENT OF BBA

| SEMESTER | PAPER CODE | SUBJECT | CREDITS |
|---|---|---|---|
| VI | (604) DSE IV, Marketing | Retail management | 4 |

| CO NO | CO-STATEMENTS<br>**On Successful Completion of this course, students will be able to ;** |
|---|---|
| CO-01 | Acquire knowledge about marketing competencies in retailing and retail consulting. |
| CO-02 | Understandingthe workings of retail sectors |
| CO-03 | Familiarize with Retail format, store planning, effective Retail Space Management, Floor Space Management etc. |
| CO-04 | Analyse the critical and complex issues like sales promotion, store positioning, Retail Marketing Mix, CRM, Shrinkage in Retail merchandise management etc. |

*ISPAT AUTONOMOUS COLLEGE, ROURKELA*

*DEPARTMENT OF BOTANY*




## -: ***PROGRAMME OUTCOME*** :-

| OBJECTIVES | PROGRAMME OUTCOME |
|---|---|
| **1.** To understand the role & importance of plants in sustaining life on earth and the interrelationship between human beings & nature.<br>**2.** To enable students gain requisite knowledge & acquire ability to apply them as & when required.<br>**3.** To create awareness on natural resources & their importance in sustainable development. | **1.** A fundamental understanding, comprehension, analysis & articulation of concepts studied.<br>**2.** Students will have the ability to identify problems/issues & come up with creative solutions.<br>**3.** Students will apply the gained knowledge on human welfare.<br>**4.** Apply the knowledge to develop the sustainable & eco-friendly technology in industrial botany.<br>**5.** Apply knowledge of medicinal & economic botany in day to day life. |

## *COURSE OUTCOME OF B.SC. (BOTANY) :-*

| SEMESTER | COURSE & SUBJECT | CO NUMBER | CO STATEMENTS:- ON SUCCESSFUL COMPLETION OF THIS COURSE,STUDENTS WILL BE ABLE TO |
|---|---|---|---|
| SEM-1 | CORE-1 (Microbiology & Phycology) | CO-1 | To study the different microbial life forms, reasoning their biological status. |
| | | CO-2 | Students can gain knowledge on algal classification, economic & ecological importance of algae. |
| | | CO-3 | Apply the micro biodiversity knowledge gained; analyze the fundamentals of cell structure & functions of organisms. |
| | | CO-4 | Develop a strong foundational knowledge on diversity, structure & life-cycle. |
| | | CO-5 | To assess-evaluate & summarize the complex topics concerning these lower kingdom life forms. |
| | | CO-6 | A student should be able to articulate, express verbally or demonstrate/write comprehensively on any of the topics covered. |
| | CORE-2 (Bio molecules & Cell biology) | CO-1 | To study the structure, properties & functions of cell & it's components. |
| | | CO-2 | Students can understand the detailed knowledge on structure, classification & |

| | | | |
|---|---|---|---|
| | | | physicochemical properties of bio molecules. |
| | | CO-3 | Apply the knowledge gained, analyze the fundamentals of cell ultra structure, the structure & functions of cell organelles & cellular macro-micro bio molecules. |
| | | CO-4 | Students can analyze the knowledge on properties of cell & cell membrane, DNA staining techniques. |
| | | CO-5 | To assess-evaluate & summarize the knowledge on qualitative tests of bio molecules. |
| SEM-2 | CORE-3 (Mycology & Phytopathology) | CO-1 | To study detailed structure of fungus, different types of fungal spores & their mode of liberation. |
| | | CO-2 | Students can understand the detailed knowledge on different classes of fungi, their structure, classification life-cycle & reproduction. |
| | | CO-3 | Knowledge on diseases in plants caused by viruses, bacteria & fungi & biotechnological applications of fungi. |
| | | CO-4 | Conceptualize questions in the above mentioned complex subjects in plant life forms & their life-cycle. |
| | | CO-5 | Ability to summarize all the biological concepts illustrated through the topics covered & self-assesses the comprehension levels. |
| | | CO-6 | Acquire expression abilities on the above topics in writing, discuss or write in shapes of short/long, topic specific notes. |
| | CORE-4 (Archegoniate) | CO-1 | Students can get detailed knowledge on morphology, anatomy, classification & properties of bryophytes, pteridophytes & gymnosperms. |
| | | CO-2 | Brief explanation on contribution of paleobotany with emphasis on Palaeozoic & Mesozoic era. |
| | | CO-3 | Understand spore morphology analysis & detailed knowledge on male & female reproductive structures in gymnosperms. |
| | | CO-4 | Identify key concepts/ideas on life forms under archegoniate, reasoning their phylogeny & biological status in plant kingdom. |
| | | CO-5 | Ability to summarize all the reproduction, economic importance & ecological |

| | | | |
|---|---|---|---|
| | | | significance of all plant kingdoms. |
| | GE-2A<br>(Plant Physiology & Metabolism) | CO-1 | Define the terminologies:- plant water relations, ascent of sap, transpiration, plant growth regulators & nitrogen metabolism. |
| | | CO-2 | Explain processes of mineral nutrition, absorption of water, mechanisms of water loss from plants. |
| | | CO-3 | Demonstrate processes of imbibition, osmosis and plasmolysis. |
| | | CO-4 | Comprehend the different physiological processes & metabolic pathways in plants. |
| | | CO-5 | Ability to summarize all the biological concepts illustrated through the topic. |
| | | CO-6 | Come-up with comprehensive notes that students can articulate, express, write in any verbal or written assessment process. |
| SEM-3 | CORE-5<br>(Anatomy of angiosperms) | CO-1 | To study the internal structure & arrangement of tissues in angiospermic plant. |
| | | CO-2 | Understand different types of plant tissues. |
| | | CO-3 | Know the morphological & anatomical adaptations of plants growing in different habitats. |
| | | CO-4 | Students can analyze the anatomical studies of leaf, stem & root. |
| | | CO-5 | Ability to summarize the structure & functions of all tissues. |
| | | CO-6 | Hands on experiences on slide preparation for anatomical studies. |
| | CORE-6<br>(Economic Botany) | CO-1 | Students can enhance their knowledge on morphology, uses & economic importance of crop plants. |
| | | CO-2 | Botanically identify & technically describe several economically important Cereals, Pulses, oil yielding plants, spices & medicinal crops of India. |
| | | CO-3 | Knowledge on uses of industrially important plant. |
| | | CO-4 | Analyze the knowledge on economically important plant parts & their products. |
| | | CO-5 | Ability in conceptualizing the above prescribed topics. |
| | CORE-7<br>(Genetics) | Co-1 | Students will understand the genetic terminology of genetics & laws of mendelism. |
| | | CO-2 | Understand the fundamentals of Mendelian genetics, it's deviations & their applications. |

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| | | CO-3 | Students will able to construction of linkage map by test-cross. |
| | | CO-4 | Develop analytical abilities foe solving problems in genetics. |
| | | CO-5 | Student gets idea & easily evaluates various types of inheritance & structural changes in chromosome. |
| | | CO-6 | Understanding the concept of gene structure, gene mutations & population genetics. |
| SEM-4 | CORE-8<br>(Molecular Biology) | CO-1 | Define terminologies related to molecular biology. |
| | | CO-2 | Student should be able to gain knowledge in different aspects of nucleic acids, their structure &v functions including historical perspectives. |
| | | CO-3 | Have a clear idea on the mechanisms involved in storage, processing & transmission of bio-genetic information through DNA replication. |
| | | CO-4 | Understand the cytological aspects of growth & development. |
| | | CO-5 | Understand DNA as the basis of heredity & variation. |
| | | CO-6 | Student can get practical acquaintance of isolation & quantification of DNA from plants. |
| | CORE-9<br>(Plant ecology & Phytogeography) | CO-1 | Students can gather knowledge on origin, formation & properties of abiotic components of the ecosystem. |
| | | CO-2 | Knowledge on properties of communities in a population & tropical and habitat organization in an ecosystem. |
| | | CO-3 | Study & acquired knowledge about ecological ecosystem dynamics including different components of environment. |
| | | CO-4 | Develop comprehensive ideas on population ecology & dynamics, different phytogeographic classification of the state & country, concepts of continental drift & endemism. |
| | | CO-5 | Practical knowledge on vegetation study & different ecological sites. |
| | | CO-6 | Come-up with comprehensive notes that students can articulate, express, write in any verbal or written assessment process. |
| | CORE-10 | CO-1 | To gather an overview of nomenclature, |

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| | (Plant Systematics) | | identification, classification& studying the concept of taxonomy. |
| | | CO-2 | To learn the techniques of effective & valid publication and knowledge about ICAN & it's principles. |
| | | CO-3 | Students will be able to learn the characters of various families, their key & floral formula, systematic position & herbarium preparation. |
| | | CO-4 | Able to determine the characteristic of plants like Asclepidiaceae, Lamiaceae, Acanthaceae, Rubiaceae families. |
| | | CO-5 | Students can face assessments on any evaluation process on the above mentioned topics along with concepts of biosystematics, identification, virtual herbarium, E-flora. |
| | | CO-6 | Various local & long excursions in this course will help to familiarise the students with the methods of collection, preservation of plants & learning about them. |
| | GE-2B<br>(Plant anatomy, Embryology & Biotechnology) | CO-1 | Imparting an insight into the internal structure & reproduction of the most evolved group of plants, the angiosperm. |
| | | CO-2 | Understand the individual cells & also tissues simultaneously. |
| | | CO-3 | Understand the structural adaptations in plants growing in different environment. |
| | | CO-4 | Understand the morphology & development of reproductive parts. |
| | | CO-5 | Understand the techniques used to preserve & study plant materials. |
| | | CO-6 | Students can learn flower dissection & study of flower reproductive parts. |
| SEM-5 | CORE-11<br>(Reproductive biology of angiosperms) | CO-1 | State & visualise the history & scope of sexual reproduction in higher plants. |
| | | CO-2 | Identify & discuss different important concept points on pollen & ovule biology starting from sporogenesis. |
| | | CO-3 | Describe the process of double fertilization& triple fusion. |
| | | CO-4 | Develop clear cut ideas on embryo, endosperms, structure of pollen. |
| | | CO-5 | Understand the knowledge on embryology & embryological abnormalities in angiosperms. |
| | CORE-12 | CO-1 | Student can acquire detailed knowledge on |

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| | (Plant Physiology) | | mechanisms of water, minerals & nutrient absorption of plants. |
| | | CO-2 | Understand the concept of plant-water relationship. |
| | | CO-3 | Demonstrate the processes of imbibition, osmosis, transpiration. |
| | | CO-4 | Develop clear cut ideas on water potential, it's component interactions in water relations. |
| | | CO-5 | Establish & display the mechanisms of water & mineral conduction, photosynthetic translocation. |
| | | CO-6 | Students will have hands on training to determine the physiological experiments related to plants. |
| | DSE-1<br>(Analytical techniques in plant science) | CO-1 | To gain knowledge on different types of instruments & techniques involved in plant study. |
| | | CO-2 | Understand the principles & application of centrifuge. |
| | | CO-3 | Students can enhance their basic knowledge on biostatistics including measures of central tendency. |
| | | CO-4 | Students can acquire knowledge on microscopy. |
| | | CO-5 | Students can analyze the different analytical techniques of separation, profiling & identification of plant cells. |
| | | CO-6 | While a student is able to critically analyze the topics enunciated above can evaluate & state the concepts & phenomenon clearly that underlie the above mentioned subject. |
| | DSE-2<br>(Natural resources management) | CO-1 | To discuss basic concepts of natural resources, sustainable utilization, biological resources, management strategies. |
| | | CO-2 | To understand the management of agricultural, horticultural, sericultural utilization & soil degradation. |
| | | CO-3 | Students will learn about contemporary practices in resources management, EIA, GIS, ecological footprint, waste management. |
| | | CO-4 | Understanding National & International efforts in resources management & conservation. |
| | | CO-5 | Students can improve their basic understandings on IPR, global arena on resources management. |

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| | | CO-6 | Hands on experience on forest study using tools like GPS/GIS & understanding the ecological importance of forest resources. |
| SEM-6 | CORE-13<br>(Plant Metabolism) | CO-1 | To give a comprehensive idea on the concept of metabolism, pathways & their regulations, various cycle in plants like Calvin, HSK, C3, C4, CAM etc. |
| | | CO-2 | Study & critically analyze the metabolic steps involved in Carbon fixation & assimilation in plants. |
| | | CO-3 | Describe the complex processes of Oxidation of Carbon along with the detailed, step wise reactions in Glycolysis & energy harvest & storage in ATP synthesis. |
| | | CO-4 | Thorough study of nature, types & biosynthesis of lipids, the process of biotic * abiotic Nitrogen assimilation & metabolism involved in amino acid biosynthesis. |
| | | CO-5 | Students will have hands on training of various chromatography techniques; biochemical & measurement test & learn elaborate calculation techniques. |
| | CORE-14<br>(Plant Biotechnology) | CO-1 | To understand the fundamentals of plant tissue culture techniques & it's applications like callus culture, protoplast culture. |
| | | CO-2 | Define the concept of recombinant DNA technology, restriction mapping, gene cloning. |
| | | CO-3 | Understand the concept of totipotency, explants, callus, and micro-propagation. |
| | | CO-4 | Knowledge on development of transgenic plants for agricultural & industrial use. |
| | | CO-5 | Students can learn regarding the preparation of media for tissue culture. |
| | | CO-6 | Basic concepts of research, general laboratory practices, data collection & documentation, scientific writing. |
| | DSE-3<br>(Horticultural practices & Post harvest technology) | CO-1 | Students will understand the scope & importance of horticulture. |
| | | CO-2 | Students will learn techniques of artificial & natural propagation. |
| | | CO-3 | Students get idea about various treatments for changing flowering season according demand in the market. |
| | | CO-4 | To give information about types of gardens & floriculture technology. |

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| | | CO-5 | Students can analyze the horticultural techniques, landscaping & gardening. |
| | | CO-6 | Evaluate knowledge on post-harvest technology, disease management & germplasm management for horticulture. |
| | | CO-7 | Students will get accustomed with field visit to garden, nurseries, horticultural field & in some cold storage for giving an overall idea. |
| | DSE-4<br>PROJECT<br>(Horticultural practices & Post harvest technology) | CO-1 | Students gain knowledge in different horticultural techniques. |
| | | CO-2 | To understand the procedure & application of grafting technique. |
| | | CO-3 | Analyse the grafting techniques in ornamental plants (Rosa indica) & fruit tree (Mangifera indica). |
| | | CO-4 | Basic concepts of research, general laboratory practices, data collection & documentation, scientific writing & it's presentation through oral, power point & poster methods & how to conceptualize, design & execute a science project. |
| | | CO-5 | On completion of all six semesters, a Botany graduate should be able to express, articulate & write scientifically on any of the chapters/topics mentioned above. |

# COURSE & PROGRAM OUTCOMES OF DEPARTMENT OF CHEMISTRY ISPAT AUTONOMOUS COLLEGE,ROURKELA B. Sc Chemistry (UNDER CBCS)

After careful analysis of the course, the department of Chemistry has pointed out the following outcomes of the course.

## Course Outcomes

## After completion of these courses students should be able to;

| Semester | CourseCode | Course Outcomes |
|---|---|---|
| SEM-I | CORE-1 INORGANIC CHEMISTRY-I | CO-1. Understand the concept of structure of atoms, periodicity of elements, types of chemical bonding and redox reactions.<br>CO-2. Solve the numerical problems based on redox reactions.<br>CO-3.Understand the term specific volume, molar volume.<br>CO-4. To know Calibration and use of apparatus.<br>CO-5. Preparation of solutions of different normality/molarity of titrants. |
| | CORE-2 PHYSICAL CHEMISTR-I | CO-1. Know the concepts of different states of matter.<br>CO-2. To understand equilibria and ionic equilibria and related numerical.<br>CO-3. Know the different structures of solids.<br>CO-4. Experimental determination of surface tension and viscosity.<br>CO-5. Experimental determination of pH of different solutions |
| | CORE-3 ORGANIC CHEMISTRY-I | CO-1. Define organic acids and bases.<br>CO-2. Distinguish between geometrical and optical isomerism.<br>CO-3. Discuss kinetics, mechanism and stereochemistry of $SN_1$ and $SN_2$<br>CO-4. Compare between $E_1$ and $E_2$ reactions.<br>CO-5. Understand the evidences, reactivity and mechanism of variouselimination and substitution reactions.<br>CO-6. To determine the melting point and effect of impurities on melting point |

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| **SEM-2** | **CORE-4 PHYSICAL CHEMISTRY-II** | CO-1. Know the principles and concept of Thermodynamics.<br>.CO-2. To understand laws of thermodynamics and concept of entropy.<br>CO-3. Understand the criteria of spontaneity of a process.<br>CO-4.To know the systems of variable compositions.<br>CO-5. Measure the heat capacity of a calorimeter and calculation of enthalpies of ionization of different acids and bases. |
| **SEM-3** | **CORE-5 INORGANIC CHEMISTRY-II** | CO-1. Know the concept of metallurgy.<br>CO-2. Understand the concept of acids and bases<br>CO-3. Study of chemistry of s and p block elements and noble gases.<br>CO-4. Understand the characteristics of some food starches.<br>CO-5. Synthesis and applications of polymers.<br>CO-6. Standardization of solutions and estimation of different elements. |
| | **CORE-6 ORGANIC CHEMISTRY-II** | CO-1. To know the chemistry of halogenated hydrocarbon.<br>CO-2. Preparation and properties of alcohols, phenols. Aldehydes, ketones, carboxylic acids, esters, ethers and thio ethers.<br>CO-3. Synthetic applications of active methylene compounds.<br>CO-4. Acylation of aliphatic and aromatic amines experimentally.<br>CO-5. Bromination and nitration of different organiccompounds. |
| | **CORE-7 PHYSICAL CHEMISTRY-III** | CO-1. To know the concept of phases, components and degrees of freedom.<br>CO-2. To understand rates, order and molecularity of a reaction.<br>CO-3. To know the concept of catalyst and catalysis.<br>CO-4. Determination of partition coefficient.<br>CO-5. To determine rate constants. |
| **SEM-4** | **CORE-8 INORGANIC CHEMISTRY-III** | CO-1.Understand about coordination compounds.<br>CO-2.Know isomerism in coordination compounds.<br>CO-3 Study the Crystal Field Theory.<br>CO-4.Determination of CFSE<br>CO-5. Basic idea on inorganic polymers.<br>CO-6. Chemistry of Lanthanoids and Actinoids.<br>CO-7.Preparation of complexes.<br>CO-8. Estimation of Ca and Mg. |
| | **CORE-9 ORGANIC CHEMISTRY-III** | CO-1 Study of nitrogen containing organic compounds.<br>CO-2. Get knowledge on polynuclear compounds and diazonium salts.<br>CO-3. Understanding of heterocyclic compounds, alkaloids and Terpenes.<br>CO-4. Study of detection of elements in organic compounds.<br>CO-5. Qualitative analysis of organic compounds. |
| | **CORE-10 PHYSICAL CHEMISTRY -IV-** | CO-1.To study conductance of electrolytes.<br>CO-2. Discuss different types galvanic cells.<br>CO-3. Determination of cell potential and pH by EMF measurements.<br>CO-4. Carry out conductometric titrations..<br>CO-5.To calculate transport number. |

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| **SEM-5** | **CORE-11 ORGANIC CHEMISTRY -IV-** | CO-1. Know the principles of spectroscopy.<br>CO-2. To understand different types of spectroscopy.<br>CO-3. To understand UV, IR and NMR spectroscopy<br>CO-4. To give an extended knowledge about Carbohydrates.<br>CO-5. Qualitative analysis of carbohydrates |
| | **CORE-12 PHYSICAL CHEMISTRY-V** | CO-1. To understand quantum chemistry.<br>CO-2. To know application of quantum mechanics in different systems.<br>CO-3. To understand molecular spectroscopy<br>CO-4. To give an extended knowledge on photochemistry.<br>CO-5. Knowledge on spectrophotometric titrations.<br>CO-6. To understand photometric titrations. |
| | **DSE-1** | **POLYMER CHEMISTRY**<br>CO-1:To learn about the history, classification and functionality of polymeric materials.<br>CO-2: To know about the kinetics of polymerization, details on crystallization and morphology of crystalline polymers, determination of crystalline melting point of a crystalline material and the factors effecting crystalline melting point.<br>CO-3:To understand the nature and structure of polymers, determination of molecular weight of polymers and thermodynamics of polymer solution.<br>CO-4:To study the preparation, structure, properties and application of different types of addition and condensation polymers.<br>CO-5: To know how to prepare polymers by using free radical polymerization, redox polymerization, interfacial polymerization, precipitation polymerization, addition polymerization and condensation polymerization process.<br>CO-6: To learn experimentally how to characterize and analyze a polymeric compound or material. |
| | **DSE2** | **GREEN CHEMISTRY**<br>CO-1: To learn about green chemistry and its necessity.<br>CO-2: To study about the principles of green chemistry and designing the greensynthetic routes.<br>CO-3: To know about the examples of green reactions and future trends in greenreaction.<br>CO-4: To learn the synthesis, psychological properties, isolation medicinal importance and other synthetic use of terpenes and alkaloids<br>CO-5: To learn how to perform green synthesis of a number of organic compoundsin the laboratory. |

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| **SEM-6** | **CORE-12 INORGANC CHEMISTRY-IV-** | CO-1. Know organometallic compounds.<br>CO-2. Preparation and properties of different organometallics.<br>CO-3. Study of catalysis by organometallic compounds.<br>CO-4. Thermodynamics and kinetic aspect of metal complexes.<br>CO-5.Qualitative analysis of inorganic mixture. |
| | **CORE-13 ORGANIC CHEMISTRY-V** | CO-1. Chemistry of amines, peptides a d proteins.<br>CO-2. Knoledge on enzymes and nucleic acids.<br>CO-3. Study of concept of energy in Biosystem.<br>CO-4. Study of structure and importance of Pharmaceutical compounds.<br>CO-5. Determination of saponification value of esters and oils. |
| | **DSE** | **INDUSTRIAL CHEMICALS AND ENVIRONMENT**<br>CO-1. Study of industrial gases and inorganic chemicals.<br>CO-2. Knowledge on industrial metallurgy.<br>CO-3. To know the environment and its segments.<br>CO-4. To understand the concept of energy and environment.<br>CO-5. Introduction of Biocatalysis<br>CO-6. Determination of COD and BOD |
| | **PROJECT** | **DISSERTATION**<br>CO-1: To know how to do research work and write a review rticle on a particular field/topic as assigned by the teacher<br>CO-2: To know how to handle the technical devices for presenting research works. |

# Program Outcomes

The student graduating with the Degree B.Sc. (Honours) Chemistry, should acquire

## 1. Knowledge and Understanding:

- The course provides the students with comprehensive understanding of the fundamental concepts of chemistry.
- In depth knowledge of the core subjects-concept, theories, principles and its applications.
- Knowledge about the emerging topics and current developments in Chemistry andits related field.

## 2. Laboratory Skills and Techniques:

- The students gain good practical knowledge and laboratory skills by systematicallytraining them.
- Through methodical instructions the students experience hands-on training of usingbasic chemical laboratory instruments.
- Basic knowledge about preparation of laboratory reagents, solutions and also protocolsfor their safe disposal.
- Ability to conduct experiments, analyses of data and interpretation of the results.

## 3. Communication Skills:

- Students develop good communication skills in writing and speaking through vigoroustraining of recording experiments, viva-voce and presentations.
- Ability to listen and convey effectively the knowledge and information acquired toscientific community and society at large.

## 4. Competency:

- Student develop the ability to think and work independently as well as adaptability to workefficiently in diverse groups.
- A leadership qualities in student develop through its effective contributions in teamworkbased projects by designing and execution of the experiments.
- The opportunities for critical thinking, reflective thinking and analytical reasoning also addup the overall development of students.

## Portable Skills:

- Students developed problem-solving skills to solve different types of chemistry-relatedproblems.
- Attitude to be a life-long learner by consistently updating oneself with current knowledge,skills and technologies.

# Course Outcomes of Chemistry Generic Elective

**[For students having Honours in subjects other than Chemistry]**

| Semester | Course Code | Course Outcome |
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| **SEM-1 & 2** | **GE-I** | CO-1: To learn the basic concept, terms and equations of Atomic Structure; Chemical Periodicity, Chemical Bonding and Hybridisation.<br>CO-2: To learn about synthesis, properties and reactions of Aliphatic Hydrocarbons<br>CO-3: To learn about the Fundamentals of Organic Chemistry; Stereochemistry; types, Mechanism and Examples of Nucleophilic Substitution Reaction and Elimination Reaction<br>CO-4: To learn practically how to do the quantitative estimation of ions in a solution by using iodometric titration, permanganate titration and dichromate titration.<br>CO-5: To learn how to estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture and how to estimate of water of crystallization in Mohr's salt by titrating with $KMnO_4$.<br>CO-6: To study the estimation of oxalic acid by titrating it with $KMnO_4$. |
| **SEM-3 &4** | **GE-2** | CO-1: To understand detail about Chemical thermodynamics, Chemical equilibrium.<br>CO-3: To understand Acid, Base. Calculation of PH of solution. To understand about Buffer solution.<br>CO-2: To learn in detail about the preparation, properties, chemical reactions and mechanisms of Alcohol, Phenol, Ethers, Aldehydes, Ketones, Carboxylic acids, Esters, Amides, Amines, Diazonium salts, Amino-acids and Carbohydrates.<br>CO-3 Measurement of pH of different solutions Preparation of buffer solutions: |