

Programme Outcomes (POs) & Course Outcomes (COs) for the courses offered in this institute  
(Session 2023-24)

**Program Outcome- Bachelor of Science (B.Sc.)**

- To provide knowledge of scientific aspects of Botany, zoology and chemistry.
- To develop Scientific temperament.
- To develop critical thinking.
- To build confidence, better communication skills and creativity
- To enrich the problem solving capability and understanding of concept herein.
- To develop writing, teaching and presentation skills.
- To promote group activities, team work, social values.
- To motivate the students for being an active learner.
- To familiar with ethical approaches within concerned subjects and make them a good citizen.

**Program Outcome- Bachelor of Arts (B.A.)**

- To develop Scientific temperament.
- To develop critical thinking.
- To build confidence, better communication skills and creativity
- To enrich the problem solving capability and understanding of concept herein.
- To develop writing, teaching and presentation skills.
- To promote group activities, team work, social values.
- To motivate the students for being an active learner.
- To familiar with ethical approaches within concerned subjects and make them a good citizen.

**Program Outcomes- Bachelor of Commerce (B.Com)**

Students will be able:-

- (1) To Develop Managerial skills
- (2) To use Commercial Knowledge.
- (3) To understand Budgeting Policy.
- (4) To develop Entrepreneur Skill.
- (5) To learn about Human Resource Management.
- (6) Develop Numerical ability.
- (7) Be well versed with business regulatory framework.

**Programme Outcome - M.Sc. Botany**

- PO1 – To develop critical thinking and scientific temperament.
- PO2- Students will be able to enhance research and problem solving skills.
- PO3- Understand and apply knowledge of Botany in day to day activities.
- PO4- To develop collaborative, team work, ethical skills and become a lifelong learner.
- PO5- identify issues relevant to environment.



### Programme Outcome - M.Sc. Chemistry

- The goal of the Master of Science in Chemistry program is to provide students with a thorough understanding of chemistry that they can use in both academia and industry. This is achieved through advanced coursework, departmental laboratory work, and project work at prestigious universities or companies.
- To succeed in competitive tests such as the CSIR-NET, GATE, SET, and Civil Services.
- Additionally, the ability to observe and make logical deductions from scientific experiments will be cultivated.
- To apply the knowledge to develop sustainable and eco-friendly technology in the scientific community.
- Students will become familiar with the different branches of chemistry like analytical, organic, inorganic, physical, environmental, polymer and biochemistry.
- They will also learn to apply appropriate techniques for the qualitative and quantitative analysis of chemicals in laboratories and industries.

#### Course outcome – B.Sc. 1 , Zoology, Paper 1 (Animal Diversity: Non-Chordata and Chordata, Comparative Anatomy and Physiology of Non-Chordata)

Upon Completion of the course students should be able to :

CO1 – Learn about the importance of systemic, taxonomy and phylogeny to get a concrete idea of evolution of non-chordate phyla.

CO2- Understand the various morphological, anatomical structures and functions of animals of different phyla.

CO3- Get the knowledge about economic, ecological and medical significance of various animals in human welfare.

CO4- Understand the important parasites and their control measures.

CO5 – Comparison of the anatomy and physiology of the different taxa of Non-chordates.

#### Course outcome – B.Sc. 1, Zoology, Paper -2 (Cell biology, Histology and comparative anatomy and Physiology of Chordates)

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

CO1- Understand the basic structure, functioning of the cell and cell organelles and understand the intricate cellular mechanisms involved.

CO2- Understand the tissues, how tissues are produced from cells in a normal course and about any malfunctioning which may lead to benign and malignant tumour.

CO3- Develop and Understanding of the evolution of vertebrates thus integrating structure, function and development.

CO4- Understand the morphological, anatomical and physiological adaptation in diverse habitats.



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**Program Specific Outcome – B.Sc. 2 , Zoology**

- PSO1 – Students will able to describe anatomy and physiology of different systems in vertebrates.
- PSO2- Students will able to understand functioning of animal body in vertebrates.
- PSO3 – Students will able to study endocrinology of vertebrate.
- PSO4 – Students will able to explain reproductive biology in vertebrates.
- PSO5 – Students will able to understand evolution and behaviour of animals.
- PSO6 – Students will able to apply knowledge of aquaculture, sericulture, poultry and pest control for economic wellbeing.

**Course outcome – B.Sc. 1, Zoology Lab Course -1.**

After completion of practical work the outcome will be :

- CO1- Able to know animal diversity in the form of museum / slides for invertebrate and invertebrates.
- CO2- Capable to innumerate biology of invertebrates.
- CO3- Capable to explore anatomy of animals.
- CO4 – Able to understand cytological, histological and osteological configuration for animal life.
- CO5- Capable to explain haematology of animal system.

**Course Outcomes – Zoology B.Sc.-2 Paper-1 (Anatomy and Physiology)**

- CO1 – Students will be able to understand and compare Integumentary system and derived structures such as scales , hair and feathers.
- CO2 – Students will be able to understand and compare digestive system of vertebrates.
- CO3 – Students will be able to understand respiratory organs in vertebrates.
- CO4 – Students will be able to study Endoskeleton, circulatory system and excretory system in vertebrates.
- CO5 – students will be able to explain evolution of heart and aortic arches in vertebrates.
- CO6 – Students will be able to understand nervous system.
- CO7 – Students will be able to study structure and function of Eye and ear.
- CO8 – Students will understand anatomy of gonads and genital ducts.
- CO9 – Students will be able understand physiology of digestion.
- CO10 – Students will be able to understand physiology of heart and explain cardiac cycle and ECG.
- CO11 – Students will be able to understand blood coagulation.
- CO12 – Students will be able to understand mechanism and control of breathing
- CO 13 – Students will be able to understand physiology of excretion and osmoregulation.



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CO14 –Students will learn about physiology of muscle contraction and nerve impulse conduction.

**Course outcome – B.Sc. 2 Zoology Paper -2 (Vertebrate endocrinology, Reproductive Biology, Behavior, Evolution and Applied Zoology)**

CO1 – students will be able to learn about endocrine glands, hormone receptor and biosynthesis of hormones.

CO2 – Students will be able to understand endocrine disorders related to some endocrine glands.

CO3 – Students will be able to understand reproductive cycle in vertebrates and hormonal regulation herein.

CO4 – Students will be able to describe organic evolution.

CO5- students will be able to understand theories of organic evolution.

CO6- students will be able to explain variation, Mutation, isolation and natural selection.

CO7 – Students will be able to explain evolution of Horse.

CO8 – Students will be able to understand different types of animal behavior.

CO8- Students will understand effect of hormone and Drugs on behaviour.

CO9 – students will study aquaculture, sericulture, apiculture, poultry farming and pest control and apply its concepts for economic prospect.

**Program Specific Outcomes – B.Sc. – 3 Zoology**

PSO1- students will be able to understand Ecology and environment and its interaction with living beings.

PSO2- Students will be able to study aquaculture, sericulture, apiculture, poultry farming and pest control and apply its concepts for economic prospect.

PSO3- Students will be able to understand energy flow in living world.

PSO4 – Students will learn about toxicology, animal poison and food poisoning.

PSO5- Students will be able to understand microbiology and medical zoology.

PSO6- Students will learn about advanced field of biology such as Genetics, Biochemistry, cell physiology and Biotechnology.

**Course Outcomes B.Sc. – 3 Zoology Paper 1 ( Ecology, Environmental biology, Toxicology, Microbiology and Medical Zoology)**

CO1- Students will be able to understand aims and scope of ecology and major ecosystems of world.

CO2- Students will be able to explain population, communities and its characters.

CO3- students will be able to understand biogeochemical cycles, pollution and ecological succession.

CO4 – Students will be able to learn laws of limiting factor and energy flow within ecosystem.



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CO5- Students will be able to learn about conservation of natural resources and Environmental Impact Assessment.

CO6- Students will be able to understand concept of Toxicology.

CO7- Students will be able to learn Heavy Metal toxicity, animal poisons and food poisoning.

CO8- Students will be able to understand pathogenic microorganisms, protozoans, nematodes and diseases associated with it.

CO9- Students will be able to understand vector insects.

**Course Outcomes B.Sc.- 3 Zoology Paper – 2(Genetics, Cell physiology, Biochemistry, Biotechnology and Biotechniques)**

CO1 – Students will be able to understand linkage, linkage maps and sex determination.

CO2- Students will be able to learn about Gene interactions and Mutation.

CO3- Students will be able to understand chromosomal alteration syndromes and single gene disorders with reference to humans.

CO4- Students will be able to learn about pH and Buffer.

CO5- Students will be able to understand transport across membrane and Enzyme's classification and action.

CO6- Students will be able to explain structure and function of amino acids and protein.

CO7- Students will be able to understand metabolism of Carbohydrate, lipid and protein.

CO8- Students will be able to learn Recombinant DNA technique, gene cloning and application of biotechnology. CO9- Students will be able to understand functioning of pH meter, colorimeter, microscope, centrifuge, chromatography and electrophoresis.

**Course Outcomes (COs)**

**B.Sc. I - Chemistry**

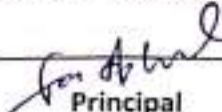
**Course Name – Inorganic Physical Chemistry**

At the end of this course, these students will be able to learn the following aspects of chemistry.

1. To learn the basic concept of atomic structure and the periodic properties of elements.
2. To understand chemical bonding in ionic and covalent compounds.
3. To study group trends for s and p-block elements in the periodic table.
4. Learn the periodic and bonding of compounds of the Nobel gases.
5. Understand the metallurgical extractions of metals.
6. Basic concepts of mathematics and computers for chemists.
7. The basic mechanism of chemical kinetics and catalysis.

**Course Name – Organic Physical Chemistry**

At the end of this course, these students will be able to learn the following aspects of chemistry.

  
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1. Understand the fundamentals of physical organic chemistry.
2. Stereochemistry of carbon compounds.
3. Chemistry of alkenes and alkyne.
4. Chemistry of acyclic and aromatic Hydrocarbons.
5. Understanding the kinetic model of gases and their properties, the behaviour of real gases, its derivation from ideal behaviour, equation of state, isotherms and law of corresponding states and Molecular velocities.
6. Fundamental concepts of liquid state and colloids and surface chemistry.
7. Solid lattice parameters - its calculation, application of symmetry, and solid characteristics of simple salts.

#### Course Name – Practical-1

At the end of this course, these students will be able to learn the following aspects of chemistry.

1. To analyse the given mixture for anions (acid radicals) and cations (basic radicals).
2. Titrations.
3. Qualitative analysis.
4. Surface tension measurements.
5. Viscosity measurement.
6. Chemical kinetics.

#### Course Outcomes (COs)

##### B.Sc. II – Chemistry

#### Course Name – Inorganic Chemistry

1. To understand characteristic properties of d-block element.
2. To understand coordination number and geometry of d-block element.
3. To understand Redox Reaction.
4. To understand Valence bond theory.
5. To understand concept of Acid and base.
6. To understand non-aqueous solvent just like  $\text{NH}_3$ ,  $\text{SO}_2$   
To understand electronic configuration of d-block element, Actinide Lanthanides.

#### Course Name – Organic Chemistry

1. To understand formation and chemical Reaction of glycol and glycerol.
2. To understand coordination number and geometry of d-block element.
3. To understand Redox Reaction.
4. To understand Valence band theory.



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5. To understand concept of Acid and base.
6. To understand non-aqueous solvent just like  $\text{NH}_3$ ,  $\text{SO}_2$
7. To understand electronic configuration of d-block element, Actinide, Lanthanides.

**Course Name – Physical Chemistry**

1. Students will be able to understand concepts of thermodynamics and thermochemistry.
2. To study concepts chemical, ionic and phase equilibrium.
3. To study photochemistry related concepts.

**Course Name – Practical -II**

At the end of this course these students will be able to learn the following aspects of chemistry.

1. To analyse the given mixture for anions (acid radicals) and cations (basic radicals).
2. Volumetric analysis.
3. Qualitative analysis.
4. Preparation of organic compound
5. Transition temperature.
6. Thermochemistry.
7. Phase equilibrium.
8. Molecular weight determination

**Course Outcomes (COs)**

**B.Sc. III - Chemistry**

**Course Name – Inorganic Chemistry**

1. Students will be able to know metal ligand bonding in transition metal complexes and their magnetic properties.
2. To develop understanding on Organometallic compounds and Bioinorganic chemistry.
3. To study Hard and Soft acids and bases, Inorganic Polymers.

**Course Name – Organic Chemistry**

1. Students will study about heterocyclic compounds, organometallic reagents.
2. To understand organic synthesis via enolates.
3. Able to know Biomolecules such as carbohydrate, amino acids, proteins, and nucleic acids.
4. Students will be able to understand synthetic polymers and synthetic dyes.
5. Types and functioning of infrared spectroscopy, UV- visible spectroscopy and NMR spectroscopy.

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**Course Name – Physical Chemistry**

1. Students will be able to explain concepts of quantum mechanics, vibrational spectroscopy, and Raman Spectrum.
2. Students will learn about concepts related to Electrochemistry.
3. Students will be able to explain concepts of quantum mechanics, vibrational spectroscopy, and Raman Spectrum.
4. Students will learn about concepts related to Electrochemistry.

**Course Name – Practical -III**

At the end of this course these students will be able to learn the following aspects of chemistry.

1. Gravimetric analysis.
2. Preparation of inorganic complexes.
3. Preparation of organic compounds.
4. Explain/define different terms in conductometry.
5. Explain/define different terms in calorimetry.
6. Understand the theoretical principles with the help of practical's such as UV-Viz., NMR, IR etc.

**Class- B.A.-I**

**Subject-Sociology-I**

**Introduction to Sociology**

**Course Outcomes**

By the end of the course students will be able to reflect / develop understating on following concepts-

1. Students will be able to understand meaning , nature scope, matter and significance of sociology and social structure of society.
2. Students will be able to understand social institutions, culture and society, norms and values.
3. Students will learn about social stratification and social mobility
4. Students will learn about social change
5. Students will be able to understand social systems and processes.

**Class- B.A.-I**

**Subject-Sociology-II**

**Contemporary Indian Society**

**Course Outcomes**

By the end of the course students will be able to reflect on following concepts-



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1. View about Indian society – The classical view Varna, Ashram, Karma and Dharma, field view M.N.Shriniwas and S.C.Dubey.
2. The structure and composition of Indian society village, town, cities and Rural Urban tribes Dalits, woman and minorities.
3. Basic institution of Indian society caste system kinship, family marriage, changing dimension.
4. Family problem Dowry, domestic violence, divorce, conflict problems of elderly.
5. Folk culture of Chhattisgarh.

**Class- B.A.-II**

**Program specific outcome:-**

- Introduction to the basic concept of sociology subject matter and importance of sociology and origin and development of sociology.
- Understanding in brief the knowledge of human society and sociology.
- Introduction to the various scientific methods in the students.
- Understanding various segment and unity of the Indian society.
- Understanding the social aspects of tribes in India.
- Introduction the Indian ruler social structure.
- Understanding the nature of village studies conduct by different audiology given by various Indian sociologists.
- Understanding the economic and developmental of tribes in India.

**Course Outcomes**

**Paper 1 – Sociology of Tribal Society**

Students will show knowledge on-

1. Tribes and Caste
2. Classification of tribal people
3. sociocultural profile of tribal society
4. Tribal sensitization
5. Problems of tribal people.

**Paper – 2 Crime and Society**

1. Conception and type of crime yearly explanation classical, positive, physiological.
2. Social structure and anomic, suicide organized crime, white color, cases terrorism.
3. Indian social problem- nature of social change and crime in India, social disorient an Alcoholism, Drug Addiction, beggary.
4. Correctional process- Role of police and judiciary in India, Development of jail reform in India sociology of prison.
5. Punishment- Objectives and forms major theories of punishment, modern correctional concept, probation, parole, open prison.

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**Class- B.A.-III**

**Paper 1 – Sociology of Tribal Society**

Students will show knowledge on-

1. Tribes and Caste
2. Classification of tribal people
3. sociocultural profile of tribal society
4. Tribal sensitization
5. Problems of tribal people.

**Paper 2 Social Research Methods**

Students will be able to know research in sociology-

1. Meaning and significance of research.
2. Hypothesis formation
3. Scientific methods
4. types of research
5. Techniques and data collection
6. Representation and analysis of data

**Course Outcome**

**B.A.Part-1 Economics**

**Paper-1 Principles of Microeconomics**

1. Students after passing this course will understand rationale behaviour of microeconomics.
2. Students will know about the production process along with it they will also be able to explain the markets and their composition.
3. The students will have knowledge of welfare which is a bivot the equality and justice.
4. Study of microeconomics help the students to know and judge the basics of buying and selling and product pricing.

**B.A. Part 1-Economics**

**Paper-2 Indian Economy**

1. The students learn about the state of Indian Economy pre and post-independence.
2. The students learn about the planning process and its achievements in Indian Economy.
3. The students come across with the new economic reforms introduced in Indian Economy in the year 1991 and its role in India development.
4. The students will come to know about some social problems like over population, education, health, nutrition, poverty, unemployment.
5. The students will learn the problems and prospectus of agriculture sector in India.
6. The students learn various aspects of industrial development and reforms process in the industrial economy.
7. The students learn the role of foreign trade on Indian economy. They will also learn various aspects of foreign trade in India.



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8. The students learn the state income of Chhattisgarh in the form of GSDP, per capita income, sectorial contribution etc.
9. The students also learn about the importance of agriculture in Chhattisgarh's economy.
10. The students learn about various crops, their productions and productivity.
11. The students learn about various industries and infrastructure facilities in Chhattisgarh.

**B.A. Part 2 Economics**

**Course outcome Paper -1**

After completion of this course the students will be able to-

1. Define and explain process of calculating National Income Identify it's Components demonstrate circular flow of income, concept of social accounting, green accounting.
2. Understand Say's law of market ,Classical theory of employment and Keynes Objection to the classical theory. Demonstrate the principle of effective demand and Income determination.
3. Explain the concept of consumption function. relationship between APS and MPS Keynes's psychological law of consumption. determinants of the consumption Function.
4. Understand the relationship between investment and saving. Demonstrate Investment multiplier and concept of MEC and MEI.
5. Explain the nature and characteristics of trade cycle and various theories of trade Cycle. analyze the control of trade cycle.
6. Identify the basic difference between inter regional and international trade and Various international trade theory Comparative advantage theory, Opportunity Cost theory and Heckscher Olhin theory. International trade and their contribution to Economic development.
7. understand Tariffs & import quotas ,optimum tariff. Balance of trade & balance of Payment, Equilibrium & disequilibrium in BOP. Merit and demerits of devaluation Foreign trade multiplier.
8. Evolution of IMF, World Bank ,WTO, International monetary reforms and India.
9. Foreign trade in India, recent change in composition and direction of foreign trade. India's balance of payment, Export promotion and import substitution in India .multi National Corporation and India.

**B.A. Part- 2 Economics**

**Course outcome Paper-2**

After successfully completion of this paper a students will be able to

Understand -:

1. Meaning and functions of money, Gresham's law .illustrate various versions of quantity theory of money.



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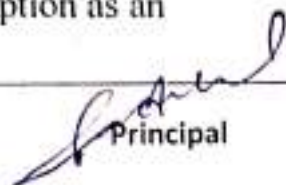
2. Illustrate the Inflation ,deflation, and reflation types, causes and effects on Different sectors of the economy. Demand pull and cost push inflation. Measures to control inflation. Philip's curve, Demonetization .
3. Banking- meaning, types and function of commercial banks, credit creation, Liabilities and assets of banks, Evolution of commercial banking, Function of central bank, Role and function Reserve bank of India. Objective and Limitation of Monetary policy with special reference to India.
4. Understand the meaning and scope of public finance. distinction between private And public finance, Public and private goods ,principle of maximum social advantage Demonstrate the role of government in economic activities.
5. Meaning, classification and principles of public expenditure, trends in public Expenditure and causes of growth of public expenditure in India.
6. Sources of public revenue, taxation- Meaning, canons and classification of taxes. Division of tax burden. Impact and incidence of taxes. Taxable capacity, Effects of Taxation, equity and justice in taxation, Major trends in tax revenue of the central And state Government in India.
7. Public debt and financial administration, sources of public borrowing, Effects of Public debt, Methods of debt redemption.
8. The public budget, kind of budget, classification of budget, preparation and passing of Budget in India.

**B.A.Part -3 Economics**

Course outcome- paper-1

After successful completion of this paper a students will be able to understand:-

1. Economic growth and development factor affecting economic growth, developed and under developed economy, different concept of poverty.
2. Marxian and Mahalanob is model of economic growth ,Balanced and unbalanced growth.
3. To make the students aware of the population, growth pattern of population. Theory of demographic transition, population, poverty and environment.
4. And Able to understand schumpeter's theory of economic growth, theory of big push, Nelson theory of low level income equilibrium trap, theory of Critical minimum effort.
5. Theory of economic growth- Harrod and domar model, Solow model, Meade's Neoclassical model, Mrs. Joan Robinson's growth model, A Lewis Theory of unlimited supply of labor.
6. Environment-Environmental and use, environmental disruption as an allocation, problem, valuation of environmental damages.

  
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7. Prevention control and abatement of pollution, environmental legislation, indicators of sustainable development, environmental accounting.
8. Concept of intellectual capital: Food, Security, Education, Health & Nutrition.
9. Role of agriculture in economic development including land reforms Efficiency & productivity in agriculture.
10. New technology & sustainable agriculture. Globalization & agriculture growth, the choice of technique appropriate technology & employment.

**B.A. Part-3 Economics**

**Course outcome Paper-2**

After successful completion of this paper a student will be able to understand:-

1. Definition and limitation of statistics, importance of statistics in economics, statistical investigation, census and sampling, methods of statistical investigation, statistical data collection of data, primary & secondary data.
2. Basic concept of statistics such as measure central tendency, measure of skewness, basic concept of probability.
3. Dispersion :Meaning and method of measuring dispersion: Range ,Quartile deviations, Mean deviation, coefficient of mean deviation, standard deviation.
4. Correlation analysis, meaning and types of correlation, degree of correlation, coefficient of correlation- karl pearson's method, spearman's Rank Difference Method, probable and standard Error.
5. Method of constructing index Number, Fisher's method, Dobrich- Bowles method, paasches method , Laspeyres Method, Consumers price index numbers, Reversal test ,circular test.
- 6 . Time series analysis- Meaning and component of time series ,measurement of long term trend by Average Method.

**Course Outcome**

**B.A. Part -1 Geography**

**Paper -1 Physical Geography**

After the completion of course the students will have ability to:-

- i. Understand the internal structure of the Earth, rocks that compose it and forces within the Earth that act to deform it.
- ii. Analyse how the natural and anthropogenic operating factors affect the development of land forms.

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- iii. Understand about the duration, process that unseasonably act at the Earth surface to shape land forms and reduce relief.
- iv. Assess the role of structure, stage and time in shaping the land forms.
- v. Identify the atmospheric pressure, winds, humidity, concept our precipitation, its types and understand the air masses and fronts and the weather forecasting.
- vi. Identify the relief of the ocean bottom, temperature, salinity of ocean water, tide currents, coral reef and ocean resources.

**B.A. Part – 1 Geography**  
**Paper – 2 Human Geography**

After the completion of the course students will have ability to:-

2. Discuss and describe the major concepts and key principles of human geography including place, space, scale and landscape.
3. Appreciate the diversity of the culture, background and the places.
4. Problem solving from a geographic perspective by understanding the role, location plays.

**B.A. Part – 1 Geography**  
**Paper – 3 Practical Geography**

After the completion of the course students will have ability to :-

1. Develop hands on skills in diagrammatic representation of data.
2. Comprehend thematic mapping techniques, its cartographic representation and interpretation.
3. Take up cartography as a profession.

**बीए भाग 2 भूगोल**  
**प्रथम प्रश्नपत्र**

इस कोर्स में विद्यार्थी –

- इकाई 1 - मौसम और जलवायु के तत्व, वायुमंडलीय तापमान, आर्द्रता, पवन, तापमान का ऊर्ध्वाधर और क्षैतिज वितरण पढ़ेंगे।  
इकाई 2 - वायुमंडलीय आर्द्रता विश्लेषण और चक्रवात प्रति चक्रवात के बारे में पढ़ेंगे।  
इकाई 3 - कोपेन का जलवायु वर्गीकरण, जीव जंतुओं की विशेषताएँ, वितरण और प्रकार के बारे में पढ़ेंगे।  
इकाई 4 - समुद्र विज्ञान का जलवायु विज्ञान और भू विज्ञान के साथ संबंध, महासागरीय तली का उच्चावचन, महाद्वीपीय विस्थापन एवं सागर तली प्रसरण, सागरीय जल का संघटन, महासागरों में तापमान का वितरण, महासागरों में लवणता, घनत्व एवं जल राशियों के बारे में पढ़ेंगे।  
इकाई 5 - महासागरों की गतियाँ, धाराएँ, तरंगें, ज्वार भाँटा और महासागरों का मानव जीवन पर प्रभाव का अध्ययन करेंगे।

**द्वितीय प्रश्नपत्र**

इस कोर्स में विद्यार्थी

- इकाई 1 - उत्तरी अमेरिका की प्रादेशिक विशेषताएँ, उत्तरी अमेरिका की भौतिक संरचना, मिट्टी, जलवायु आदि के बारे में पढ़ेंगे।  
इकाई 2 - घनों के वितरण और खनिज उत्पादन पढ़ेंगे।



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| <p>इकाई 3 -महत्वपूर्ण फसले – कृषि पेटियाँ, डेयरी फार्मिंग के बारे में अध्ययन करेंगे।</p> <p>इकाई 4 – उत्तरी अमेरिका में उद्योग, उद्योगों का विकास, उत्पादन, औद्योगिक प्रदेश, जनसंख्या और परिवहन का अध्ययन करेंगे।</p> <p>इकाई 5 -कैलिफोर्निया घाटी, न्यू इंग्लैंड प्रदेश, घाटी प्रदेश, झील प्रदेश, अलास्का प्रदेश, सेंट लॉरेंस घाटी का विस्तृत अध्ययन करेंगे।</p> <p style="text-align: center;"><b>बीए भाग 3 भूगोल</b></p> <p style="text-align: center;"><b>प्रथम प्रश्न पत्र</b></p> <p>इकाई 1 – संसाधन का अर्थ, परिभाषा, प्रकार, पर्यावरण अर्थ परिभाषा, संसाधनों का अध्ययन (जल, मिट्टी, वन , कृषि, खनिज, पशु आदि) पढ़ेंगे।</p> <p>इकाई 2 – जल, वन, शक्ति संसाधनों का उपयोग एवं वितरण, संसाधनों का आर्थिक विकास एवं संसाधन प्रबंधन, मिट्टी के प्रकार एवं वितरण, मृदा का वितरण, मृदा वितरण का अध्ययन करेंगे।</p> <p>इकाई 3 – जनसंख्या – वृद्धि, वितरण एवं घनत्व, जनसंख्या एवं संसाधनों का उपयोग का अध्ययन करेंगे।</p> <p>इकाई 4 -पर्यावरण का अर्थ, परिभाषा और मानव पर्यावरण संबंध पढ़ेंगे।</p> <p>इकाई 5 – भू मंडलीय तापन, जैव विविधता संरक्षण, संतुलन विकास, जनसंख्या विस्फोट, खाद्य सुरक्षा जैसे महत्वपूर्ण मुद्दे पढ़ेंगे।</p> <p style="text-align: center;"><b>द्वितीय प्रश्न पत्र</b></p> <p>इकाई 1 – भारत के भौतिक विभाग, प्रवाह प्रणाली, जलवायु प्रदेश, मानसून की उत्पत्ति का अध्ययन करेंगे।</p> <p>इकाई 2 -भारत के प्रकृतिक संसाधन, मिट्टी के प्रकार, वितरण एवं विशेषताएँ, खनिज संसाधन का वितरण एवं प्रकार पढ़ेंगे।</p> <p>इकाई 3 – सांस्कृतिक तत्व – कृषि उद्योग, जनसंख्या -वृद्धि, वितरण, घनत्व, सामाजिक तत्व – साक्षरता, लिंगानुपात , नगरीकरण, परिवहन एवं पर्यटन का अध्ययन करेंगे।</p> <p>इकाई 4 -छत्तीसगढ़ – भौतिक विभाग, भू गरभिक संरचना, जलवायु, मिट्टी, प्रकृतिक संसाधन, विकास के बारे में पढ़ेंगे।</p> <p>इकाई 5 – छत्तीसगढ़ की सांस्कृतिक संरचना – कृषि, उद्योग, जनसंख्या – वृद्धि, वितरण, घनत्व, सामाजिक तत्व – साक्षरता , लिंगानुपात, नगरीकरण, जनजातियाँ, परिवहन एवं पर्यटन और व्यापार के बारे में पढ़ेंगे।</p> |
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**B.Com-I**

**Program Specific Outcome**

- To provide adequate basic understanding about accounting principle among the students.
- To train the students in (Business) communication skills effectively.
- To aware about the basic knowledge of national/domestic business law.
- To deliver knowledge about the principles of business economics which are applicable in business.
- To inculcate mathematical ability as is applicable to business.
- To prepare students with the emerging issues in business at the national and international level in the light of new business policies.

**Course Outcome**

**1. Financial Accounting:-**

- To enable the students to learn principles and concept of accounting.
- To enable the students to learn the basic concept of partnership accounting and allied aspects of accounting.
- To find out the technical expertise in the maintaining the books of accounts.
- To encourage the students about maintaining the books of accounts for further reference.
- Getting working knowledge of generally accepted auditing procedure techniques and skills.

**2. Business Communication:-**

- To develop spoken communication and written communication.



Programme Outcomes (POs) & Course Outcomes (COs) for the courses offered in this institute  
(Session 2023-24)

- To understand the concept process and important of communication.
  - To provide knowledge of various media of communication.
  - To develop awareness regarding new trends in business communication.
  - To develop business communication skills through the application and exercises.
3. **Business Mathematics:-**
- To understand the concept of simple interest, Compound interest and the concept the ratio and proportion.
  - To understand the application of matrix in business.
  - To understand the linear programming and problem relating to two variables.
  - To understand the concept of commission brokerage discount and profit and loss.
  - To know the valuation of simple loans and debentures as well as problem relating to sinking funds.
4. **Business Regulatory Framework:-**
- To know the students with the basic concept terms & provisions of mercantile and business laws.
  - To develop the awareness among the students regarding this loss affecting trade business and commerce.
  - To develop well verse in basic provisions regarding legal framework governing the business world.
  - Knowing the rights and liability of every citizen regarding consumer protection act.
  - To provide understanding about Negotiable Instruments and law of contract.
5. **Business Environment:-**
- Understand business environment at national and international level.
  - Knowing the impact of liberalization, Privatization and Globalization (LPG) in Indian business/Economy.
  - To know the economic problems like growth, poverty, Unemployment and Industrial sickness.
  - To Understand the International Environment and International Economic groupings WTO, UNCTAD, IMF and GATT etc.
  - Knowing about agricultural development Industrial development and service sector development in India.
6. **Business Economics:-**
- The objective of the course is to familiarize the students the basic concept of macro and macro economics.
  - To stimulate the students interest by showing the relevance use of the various economic theories.
  - To apply economic understanding to problems of business.
  - Justifying the demand function and production function.
  - Understanding the link between business economics and business decision.



**B.COM-II**

**Program Specific Outcomes**

- Students can get through knowledge of finance and accounting.
- Students can independently start up their own business.
- Capability of the students to make decision at personal as well as professional level will increase.
- Students will gain through systematic and subject skills within various disciplines of corporate accounting law, Cost Accounting, Management and entrepreneurship.
- Students will be able to do their higher education and can make research in the field of finance and commerce.

**Course Outcomes**

1. **Corporate Accounting:-**

- This course aims to enlighten the students on the accounting procedures followed by the companies.
- To make the students about the valuation of goodwill and shares.
- To Impart Knowledge about the amalgamation, absorption and holding company account.
- To provide adequate understanding about final accounts of companies spare companies act 2013.
- To know accounting entries regarding issue forfeitures and Re-issue of shares.

2. **Company Law:-**

- To impart students the provision and procedures under company act.
  - To provide knowledge of capital management and rules and procedure of appointment of director.
  - To acquaint the students with the company meetings.
  - To update the knowledge of provisions of winding up and majority powers and minority rights.
  - To aware students regarding kinds of companies and promotion and incorporation of companies.

3. **Cost Accounting:-**

- To understand basic cost concept, elements of cost and cost sheet.
  - Ascertainment of material and labour cost.
  - To develop understanding to apply theoretical knowledge in practical situation.
  - To provide knowledge about cost Ascertainment and cost Records.
  - To impart knowledge about the concept and principles application of overheads.

4. **Principles of Business Management:-**

- To enable student understand Principles, functions and different management theories.
  - To impart knowledge about various functions of management.
  - To provide knowledge about leadership and managerial control.

5. **Business Statistics:-**

- To know use of frequency distribution to make decision.
  - To use correlation and regression analysis to estimate the relationship between two variables.



Programme Outcomes (POs) & Course Outcomes (COs) for the courses offered in this institute  
(Session 2023-24)

- To understand the concept and techniques of the different types of index numbers.
- To understand the measures of dispersion and skewness.
- Making familiar with statistical tools which are relatively used in business.

6. **Fundamentals of Entrepreneurship:-**

- Developing entrepreneurship skill among the students.
  - Enable students to acquire the skill to be an entrepreneur.
  - Creating awareness among students about self-employment.
  - Providing various innovative business ideas to the society.
  - Developing entrepreneurial behavior and social responsibility among students.

**B.COM- III**

**Program specific Outcomes**

- To enables the students to know the basics of income tax act and its implications.
- Students are imparting knowledge about the principles and methods of auditing and their applications.
- To impart basic knowledge about GST and apply the provision of GST law to various situations.
- To provide the students an understanding of the application of accounting techniques for management.
- The objective of this is to help students understand the conceptual framework of financial management.
- This is aims at acquainting the students with the working of financial market in India.

**Course Outcome**

1. **Income Tax :-**

- Knowing the procedure of calculation of income tax.
- Acquiring the knowledge about general deduction from income.
- Obtaining the knowledge about tax free incomes.
- Exposure to income tax planning.
- Getting known with application of principles and provision of direct tax laws in  
Computation of taxable income under various heads of income.

2. **Auditing:-**

- Knowledge about auditing principles and techniques of auditing.
- Getting knowledge of vouching of cash and credit transactions.
- Knowing the appointment procedure of auditor.
- Acquiring the skills of audit program of co-operative societies and banks.
- Knowledge about writing of audit reports.

3. **Indirect Taxes with GST**

- Students will able to compute the assessable value of transactions related to goods and services for levy and determination of duty liability.
- Students will able to understand the basic principles underlying the indirect taxation statutes.
- Students will able to identify and analyze the procedural aspects under different applicable statutes related to GST.



Programme Outcomes (POs) & Course Outcomes (COs) for the courses offered in this institute  
(Session 2023-24)

- Students will able to understand tax liability and taxable entities.
- Student will able to examine the method of tax credit. Inflow and outflows. Outflows: tax imposition, tax exemption, tax deduction.

**4. Management Accounting**

After completion of this course the student would be able to-

- Explain the financial concept used in making accounting management decision.
- Use business finance terms and concept when communicating.
- Use effective communication skills to promote respect and relationship for financial deals.
- Demonstrate a basic understanding of accounting management.
- Utilize information by applying a variety of business and industry software and hardware to major financial functions.

**5. International Marketing :**

1. Have developed an understanding of major issues related to international marketing
2. Have developed skills in researching and analyzing trends in global markets and in modern marketing practice
3. Be able to assess an organization's ability to enter and compete in international markets.

**6. Principal of Marketing :-**

This paper provides knowledge about what is Marketing and how it's used ,Identify the primary marketing activities of an organization, Determine market segments and target customers. Apply principles of ethics and social responsibility in marketing.

कोर्स आउटकम

बीए/ बीएससी/ बी कॉम – भाग -1 हिन्दी भाषा आधार पाठ्यक्रम

पाठ्यक्रम का उद्देश्य –

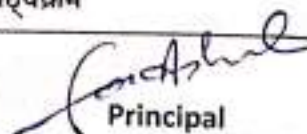
1. हिन्दी भाषा के प्रयोजनात्मक स्वरूप का सामान्य ज्ञान प्रदान करना ।
2. कंप्यूटर में हिन्दी भाषा के प्रयोग की आवश्यकता के अनुरूप कंप्यूटर के कार्यप्रणाली की आरंभिक जानकारी से अवगत होने के लिए प्रेरित करना ।
3. हिन्दी व्याकरण की बुनियादी ज्ञान सम्प्रेषण, कौशल तथा भाषाई दक्षता से अवगत कराना ।
4. साहित्य और समाज को समझने की दिशा में रुझान उत्पन्न करना ।

पाठ्यक्रम अधिगम परिणाम –

इस पाठ्यक्रम को पूर्ण करने के पश्चात विद्यार्थी –

1. इस प्रयोजनात्मक तथा कार्यशील भाषा के प्रति सजग होंगे ।
2. भाषा संबंधी संभावित अशुद्धियों एवं उनके परिष्कार से परिचित होंगे तथा मानक भाषा का व्यवहार करने में सक्षम होंगे ।
3. विद्यार्थियों के शब्द भंडार में वृद्धि होगी ।
4. हिन्दी साहित्य के पठन पाठन के प्रति रुचि जागृत होगी एवं सामाजिक महत्व के विविध आयामों को समझने की दृष्टि विकसित होगी ।

बीए/ बीएससी/ बी कॉम – भाग -2 हिन्दी भाषा आधार पाठ्यक्रम

  
Principal

**Office of The Principal**  
**Nayak Nityanand Sai Govt. College Aara Dist. – Jashpur (CG)**

No. 164

Date -28/11/2024

**Programme Outcomes (POs) & Course Outcomes (COs) for the courses offered in this institute**  
**(Session 2023-24)**

1. द्वितीय वर्ष में खंड 'क' में विभिन्न लेखकों के निबंध जैसे – महात्मा गांधी जी द्वारा लिखा गया निबंध 'सत्य और अहिंसा', विनोबा भावे (ग्राम सेवा), आचार्य जे.ए. देव (युवकों का समाज में स्थान), हरी ठाकुर (श्री गुरु चंद्र बघेल), चतुर्वेद शरण आग्रवाल (मालूम), भगवत शरण उपाध्याय (हिमालय की व्युत्पत्ति) आदि पढ़ेंगे।
2. खंड 'ख' में हिन्दी भाषा और उसके विविध रूप जैसे कार्यालयीन भाषा, मीडिया की भाषा, वित्त एवं वाणिज्य की भाषा, मशीन की भाषा के विषय में विस्तार से अध्ययन करके इसके महत्व को जानेंगे।
3. खंड 'ग' में सत्ता, सर्वनाम, विशेषण, क्रिया विशेषण, समास, संधि एवं संक्षिप्तियाँ पढ़ेंगे।

**बीए/ बीएससी/ बी कॉम – भाग -3 हिन्दी भाषा आधार पाठ्यक्रम**

1. तृतीय वर्ष में विद्यार्थी सुमित्रानंदन पंत द्वारा लिखित कविता "भारत माता" के बारे में पढ़ेंगे। परशुराम की प्रतीक्षा, रामधारी सिंह दिनकर, बटुन बड़ा सवाल, मोहन राकेश का नाटक, कथन की शैलियों के बारे में पढ़ेंगे।
2. विकासशील देशों की समस्याओं, प्रौद्योगिकी एवं नगरीकरण का अध्ययन करेंगे।
3. पर्यावरण प्रदूषण और धारणीय विकास एवं कार्यालयीन पत्र के महत्व की जानकारी प्राप्त करेंगे।
4. भारत के सदस्य गरीबी तथा बेरोजगारी के प्रकारों के बारे में जानकारी प्राप्त करेंगे और इन्हें दूर करने के प्रयासों के बारे में पढ़ेंगे।
5. अनुवाद करने और अनुवादक के गुणों के बारे में सीखेंगे।
6. ऊर्जा के अर्थ व महत्व के बारे में सीखेंगे तथा घटनाओं, समारोहों आदि का प्रतिवेदन और विभिन्न प्रकार के निमंत्रण पत्रों को लिखना सीखेंगे।

**UG Class- I,II,III (English Foundation Course)**

**Programme Outcome for English Language B.A./B.Sc./B.Com – 1,2,3**

The Programme enables a student to get acquainted:

- With the rich cultural heritage and develops patriotic feelings through the works of Indian authors & poets.
- To get exposure of the usage of grammar according to contemporary times.
- To have an exposure about the literary genre with the help of the authors & poets across the globe.
- To develop an appreciation for English language & communication skills.

**Learning Outcomes (English Language) B.A./B.Sc./B.Com – 1,2,3**

The learning outcomes are as follows:

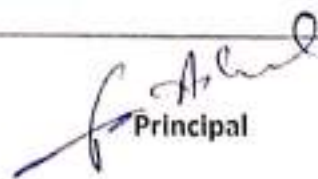
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**Subject-Environment Studies**

**Program specific Outcomes:-**

1. Understanding environmental Circumstances by the students at the undergraduate level.
2. Understanding the relationship of man with the environment and half then change his attitude and more positive eco friendly and sustainable life style.
3. Greeting information about climate change global warming, Acid rain, green house effect, ozone.
4. Cultivating attitude to safeguard the environmental built particularly with field experience.
5. Greeting information about environment protection Acts.

**Course Outcomes:-**

  
Principal



Programme Outcomes (POs) & Course Outcomes (COs) for the courses offered in this institute  
(Session 2023-24)

Students will be able to understand and explain following aspects relevant to environmental concern-

1. The multi disciplinary nature of environmental studies. Nature resource renewable and non renewable studies.
2. Eco system:- Concept Structure and function of an ecosystem. Biodiversity and its Conservation.
3. Cases effect and control measures of- Air, Water, Soil, Marine, Nuclear, Pollution, Solid waste Management, Disaster Management.
4. Environmental management- Environmental Protection Act.
5. General Background and historical perspective, Human Rights UNO charter, Human Rights 1948.
6. Impact of human rights norms of India, Human rights under the constitution of India. National human rights commission, state human right commission and human right court in India.

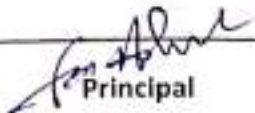
**Course Outcome (M.Sc. Botany)**  
**Programme Outcome (M.Sc. Botany)**

- PO1 – To develop decision making, critical thinking and scientific temperament.
- PO2- Students will be able to enhance research, research methodology and problem-solving skills.
- PO3- Understand and apply knowledge of Botany in day-to-day activities.
- PO4- To develop collaborative, team work, ethical skills and become a lifelong learner.
- PO5-To apply the positive approach toward sustainability goal and Identify issues relevant to environment.

**Programme Specific Outcomes (M.Sc. Botany)**

- PSO1- To give students exposure to recent developments and relevant to today's issues.
- PSO2- Apply research methodologies and able to use instruments in plant Science
- PSO3- Able to do research methodology, data collection, analyse and prepare necessary documentation of related to research work relevant to plant science.
- PSO4- Able to Identify characteristic feature of higher and lower plants and classify them easily.
- PSO5- Able to apply the plant science knowledge for outreach program and social issues.

**Course Outcome (M.Sc. Botany)**

  
Principal

**M.Sc. 1st Semester (Botany)**

**Paper -1 (Microbiology)**

CO1- Students will be able to understand basic concept and dimensions of important and application of Microbes.

CO2- This course is aimed towards generating fundamental knowledge, concepts and dimensions of botany/plant science and instrumentation related to microbe culture and its multiplication.

**Paper -2 (Phycology)**

CO1- Students will be able to understand fundamental knowledge, basic concept and dimension of importance and application of algae.

PO2- This course is aimed towards generating fundamental knowledge of algae morphology, diversity, nutrition, reproduction, Classification and Pigmentation.

**Paper -3 (Mycology)**

CO1-Students will be able to understand basic concept of Mycology.

CO2- This course is aimed towards generating fundamental knowledge of fungi, Mode of Nutrition, general characteristics, distribution, Classification and economic importance.

**Paper – 4 (Research Methodology and computer application)**

CO1- Students will be able to understand basic concept of research.

CO2- Gets acquainted with various resources for research, computer fundamentals, office software packages and become familiar with tools of research.

CO3- Gets conversant with sampling techniques, methods of research and techniques of analysis of data.

CO4- Achieves skills in various research writings.

**Paper – 5 (Bryophytes and Pteridophytes)**

CO1- Students will be able to understand basic concept of dimensions of importance and application of bryophytes and pteridophytes.

CO2- This course is aimed towards generating fundamental knowledge, concepts and dimensions of botany related to affinities, fossil bryophytes and pteridophyte plants.

CO3- Students will be able to understand classification, morphology and anatomy of gametophytes and sporophyte, origin and evolution of bryophyte and pteridophytes.

**Practical 1 - LBT111 Based on Paper MBT101 & MBT102**

CO1- Students will be able to do practical such as identification microbe and Algae and their negative and positive effect on nature.

**Practical 2 - LBT112 Based on Paper MBT103 & MBT105**

CO1- Students will be able to easily identify the fungus colonies and archegoniate vegetation and their impacts on ecosystem.

**M.Sc. 2nd semester (Botany)**

**Paper -I (Gymnosperm and Palaeobotany)**

CO1- Students will be able to understand basic concept of palaeobotany, earth stratigraphy, gymnosperm and fossil plants includes its morphology, origin and evolution of gymnosperm, affinities, distribution, cytogenetics, Classification & economic importance and Biotechnology



of gymnosperms. This course is aimed towards generating fundamental knowledge, concepts and dimensions of botany.

**Paper -2 (Angiosperms: taxonomy and Embryology)**

CO1- Students will be able to understand fundamental knowledge, concepts and dimension of identification, classification, importance and application of higher plants (Angiosperms).

CO2-Students will be able to understand basic concept of Taxonomic Principles, Classification System, economically important families, Numerical Taxonomy, Morphology of Flower and its development stages till fertilization and Experimental Embryology.

**Paper -3 (Plant Physiology)**

CO1-Students will be able to understand various concept and dimensions of importance and application of life Process of Plants.

CO2- Students will be able to understand fundamental concepts of Respiration, Photosynthesis, Plant Growth Regulators, Sensory Photobiology and water relations in plants

CO3- Students will be able to know the importance metabolic activity of plants.

**Paper – 4 (Elective paper – Ecology and Phytogeography)**

CO1- Students will be able to understand basic concept and dimension of importance, distribution and application of plants for healthy environment.

CO2- Students will be able to understand fundamental of ecology and vegetative organisation characteristics, ecosystem and ecosystem stability& phytogeography of Indian subcontinents.

**Project Work – Skill development & Social outreach**

CO1 – Students will be able to study enhance research & practical skills and engage in society through this skill development and social outreach course.

**Practical 1 - LBT211 Based on Paper MBT201 & MBT202**

CO1- Students will be able to identify Early land plant and Gymnosperm Naked Seed plant anatomy and morphology and how to collect specimen and mounted it.

CO2- Students will be able to understand Angio spermic families by its floral morphological and plant anatomy.

**Practical 2 - LBT212 Based on Paper MBT203 & MBT205**

CO1- Students will be able to understand Plant Physiology through experiment related to transpiration, respiration and photosynthesis etc.

**M.Sc. 3rd semester (Botany)**

**Paper – 1 (Cell Biology)**

CO1- Students will be able to understand cell biology and plant science basic and fundamental concepts.

CO1- Students will be able to understand cell structure, cell cycle, chromatin and chromosome organisation, cell to cell interaction, RNA/DNA: structure, type and its importance, Gene regulation and its expression& Cell programmed death.

**Paper – 2 (Genetics and Plant Breeding)**

CO1-Students will be able to understand basic concept of Plant Genetic and Breeding System in plants.



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CO2- Students will be able to understand various concepts such as Mendelian Inheritance, Linkage and recombination, crossing over, Population Genetics, genomics and molecular Genetics, Plant breeding Programmes.

**Paper – 3 (Plant Biotechnology and Genetic Engineering)**

CO1- Students will be able to understand some advanced concept and dimensions of importance and application of plant biotechnology and Genetically Modified organisms

CO2- Students will be able to basic concepts of Biotechnology, Plant tissue culture and method of genetic transformation in plants, tools and safety measure related to transgenic IPR, GMO case study etc.

**Paper – 4 (other supportive course – Intellectual property, Human Rights and Environment: Basics)**

CO1- Students will be able to understand basic concept of intellectual property right includes copyright and patents.

CO2- Students will be able to understand concept of human right and environment.

**Paper -5 (Plant Anatomy and Economic Botany)**

CO1- Students will be able to understand fundamental knowledge, concepts and dimension of importance and application of Plant for Society

CO2- Students will be able to understand concept of Shoot & Root Apical Meristem stomata phylogeny, phylogenetic and evolutionary of nodal anatomy, seed anatomy, Origin of Cultivated Plant, Ethnobotany, Ethnomedicinal plant and Medicinal plant.

**Paper – 5 (Developing biology)**

CO1- Students will be able to understand advanced fundamental knowledge, concepts and dimension of internal tissue system of plants and development of stem, root, flower and embryo.

CO2-Students will be able to understand the Basics of Archegoniate, vascular plants, development of flower, pollen pistil interaction & embryogenesis and seed development.

**Paper -5 (Biostatistics)**

CO1- Students will be able to understand advanced fundamental knowledge, concepts and dimension of importance and application of Biostatistics in Plant Science.

CO2-Students will be able to understand the Basics of data analysis -Biostatistics, Bioinformatics and Biological database and testing the hypothesis.

**M.Sc. 3rd Semester (Practical)**

**Practical 1 : LBT311 Based on Paper MBT301&MBT302**

CO1- Students will be able to understand basic of cytology by preparing temporary slide and permanent slide and learn how to handle the microscope.

**Practical 2 : LBT312 Based on Paper MBT303&MBT305**



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CO1- Students will be able to understand basics of plant biotechnology via performing Media preparation and inoculation, colony counting method, and sterilizing techniques of metal ,glass etc and get familiar with instruments like centrifuge Autoclave etc.

**M.Sc.4th semester (Botany)**

**Paper -1 (Plant Biochemistry)**

CO1- Students will be able to understand fundamental knowledge, concepts and dimensions of importance and application of biochemical Compound of Plants.

CO2- Students will be able to understand the concept of biochemical energetics, biosynthesis and degradation of biomolecules, enzymology, biological nitrogen Fixation, Inorganic Nitrogen Metabolism and Sulphur and Phosphorous metabolism.

**Paper -2 (Plant Pathology)**

CO1- Students will be able to understand fundamental knowledge, concepts and dimension of plant disease and their control.

CO2- students are able to understand the basics of plant pathology, disease symptoms, disease diagnosis and control measures & nature of pathogenesis.

**Paper – 3 (Instrumentation molecular techniques and bioinformatics)**

CO1- Students will be able to fundamental knowledge, concepts and dimensions of importance and application of modern techniques in plant science

CO2- Students will be able to understand the concept of Instruments Like Microscopy, Chromatographs, electrophoresis, DNA Amplification and bioinformatics.

**Paper – 4 (Ethnobotany and Conservation of Traditional Knowledge)**

CO1- Students will be able to understand principles and application of local plants and traditional knowledge.

CO2- Students will be able to identify ethnomedicinal plant, sites and conservation practices and apply it to conservation strategies to near them.

**Paper – 4 (Plant Resource Utilization and Conservation)**

CO1- Students will be able to understand fundamental knowledge, concepts and dimensions of importance and applications of plant Resource utilization and conservation practices.

CO2- Students will be able to understand basics of Renewable resources, Utilization of plant resources, Conservation of biodiversity and Indian biodiversity.

**Paper – 4 (Plant Quarantine)**

CO1- Students will be able to understand fundamental knowledge, concepts and dimensions of importance and applications of Rules of Plant Quarantine.

CO2- Students will be able to understand basics of Plant Quarantines Acts, Laws and Govt. rules regulation to protect plant from pest disease and pathogen.



**Paper 5 – Dissertation Work**

CO1- Through dissertation work students will be able to enhance scientific temper, research skill, critical think and analyse.

**M.Sc. 4th Semester (Practical)**

**Practical 1 : LBT411 Based on Paper MBT401&MBT402**

CO1- Students will be able to perform plant physiology practical like respiration, transpiration, ascent of sap, root pressure phenomenon and plant pathogen identification and diagnoses etc.

**Practical 2 : LBT412 Based on Paper MBT403&MBT405**

CO1- Students will be able to understand the basics of Instruments and Molecular Techniques: Identification of Ethnomedicinal plant and conservation Practises.

**Course outcome**

**B.Sc. Part -1 Paper-2 (BOT-1T) Microbial Diversity and Plant Pathology**

- CO1- Students will be able to understand the Viruses, Bacteria, Phycology, Mycology their structure, type, life-cycle and its economical uses.
- CO2- Students will be able to understand plant pathology and symptoms, cause and control of plant diseases & apply their knowledge in the fields to eradicate or avoid the disease.
- CO3- Students will be able to understand Microbial Techniques which will be beneficial for Agriculture and Industry.
- CO4 -Students will be able to understand life cycle of selected Genera of Different Groups such as Cyanobacteria and Lichens.
- CO5- Students will be able to understand apply different biofertilizers to enhance productivity.
- CO6- Students will be able to understand importance of mushroom technology.

**B.Sc. Part -1 Paper -2(BOT-2) Archegoniate and Plant Architecture**

- CO1 – Students will be able to understand the General Characteristics and affinities of Bryophytes, Pteridophytes and Gymnosperms.
- CO2 – Students will be able to understand Phylogenetics Relationship with the help of palaeobotanical studies; basic information of living and fossil pteridophytes; living and fossil gymnosperms.
- CO3- Students will be able to Learn Morphology and flower architecture of angiosperms.



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- CO4- Students will be able to know evolution during different era of geological time scale.
- CO5- Students will be able to understand fossilization methods.

**B.Sc. Part -1(BOT-1P)**

**Practical- Microbial Techniques and Archegoniate identification**

CO1 -Students will be able to understand the instruments, techniques and good lab practices for working in amicrobial laboratory.

Co-2 To Develop Skills for Identifying Microbe and using them for Industrial, Agriculture and Environment Purpose.

CO3 -Students will be able to do Practical skills in the field and laboratory experiments in Microbiology & Pathology.

CO4 -Students will be able to Identify Algae, Fungi, Lichens, Cyanobacteria, Bacteria, Gymnosperm, Bryophyta, Pteridophyte and plant pathogens along with their symbiotic and parasitic association.

CO5- Students will be able to initiate his own plant and Seed Diagnostic Clinic.

CO6- Students will be able to start own enterprise on microbial products.

**B.Sc. Part -2 Paper -1 Botany**

CO1- Students will be able to understand classification, binomial nomenclature, Herbarium and Botanical garden.

CO2- Students will be able to understand characteristics of some angiosperm family.

CO3- Students will know economic importance of some valuable plants.

CO4 -Students will be able to understand basic concept of anatomy in angiosperms.

CO5- Students will be able to understand basic concept of embryology in angiosperm.

**B.Sc. Part -2 Paper -2 Botany**

CO1- Students will be able to understand Introduction and scope of ecology- environment and ecological factors, hydrophytic and xerophytic and epiphytic plants.

CO2- Students learn about population community characteristics, Raunkeir's life forms, ecological niches, ecosystem and biogeochemical cycles.

CO3- Plant water relation : diffusion, osmosis, types of soil, water holding, mineral, nutrition and absorption.

CO4- Photosynthesis – photosynthetic apparatus, light reaction mechanism, ATP, C3, C4,

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CAM pathway of carbon, Respiration : aerobic and anaerobic respiration.

CO5 -plant growth hormones : Auxin, Gibberellin, cytokinin, florigen, photoperiodism, vernalization, seed dormancy, and germination plant movement.

**B.Sc. Part -2 Practical Botany**

CO1- students will be able to understand and perform practical related to – plant description, plant anatomy, plant embryology, photosynthesis, respiration, diffusion and osmosis , growth hormones

**B.Sc. Part -3 Paper -1 Botany**

CO1- students will be able to understand plant water relations and mineral nutrition.

CO2- students will be able to understand transport of organic substances and concept of enzymology.

CO3- students will be able to understand concept of respiration, nitrogen and lipid metabolism.

CO4- students will be able to understand growth and developments in plants.

CO5- Students will be able to understand concept of genetic engineering and biotechnology,

**B.Sc. Part -3 Paper -2 Botany**

CO1- students will be able to understand plant and environment : atmosphere, soil, light, temperature, hydrophytic and xerophytic plants

CO2- Community ecology : community, ecology and ecosystem, biochemical cycles

CO3- Population ecology: Growth curves, ecotypes, ecades, biogeochemical regions, vegetation, types of India.

CO4- Utilization of plants : food plan, fibres, vegetable oils.

CO5- Spices – General account on medicinal plants, beverages, rubbers

**B.Sc. Part -3 Practical Botany**

CO1- Students will be able to perform practical on transpiration rate in plants.

CO2- Biochemical tests.

CO3- Ecological exercise / soil analysis

**Course Outcomes (COs)**

**First Semester**

**Paper – Inorganic Chemistry – I**

CO 1. Discussion of group theory imparts various symmetry-dependent spectroscopic features of transition metal complexes.

CO 2. To develop an understanding of the evolution of bonding theories in transition metal complexes and their role in rationalizing various physical phenomena including magnetic and spectral properties.

CO 3. Discussion of Metal Ligand equilibria in solution.



**Paper – Organic Chemistry – I**

- CO 1. To understand the concept of aromaticity and properties of aromatic compounds.
- CO 2. Basic knowledge of nucleophiles, properties and mechanism of substitution reactions.
- CO 3. Understanding of neighbouring group participation in organic synthesis and how it plays a role in organic reactions.
- CO 4. Basic ideas of the generation of various reactive intermediates and role in organic synthesis.
- CO 5. To explain the basic concepts, importance, and applications of asymmetric synthesis.

**Paper – Physical Chemistry – I**

- CO 1. To develop the concept of mathematics in quantum chemistry and the basics of quantum chemistry.
- CO 2. Understand the basics of thermodynamics.
- CO 3. To understand Debye Huckel's theory, thermodynamics of electrified interface.
- CO 4. Understanding of various types of specialized chemical reactions and their kinetics.
- CO 5. Understanding the concepts of surface chemistry and catalysis including homogeneous and heterogeneous catalysis.

**Paper – Theory and Application of Spectroscopy – I**

- CO 1. Electromagnetic radiation is, the interaction of electromagnetic radiation with matter absorption, emission, transmission, reflection, dispersion, polarization and scattering.
- CO 2. Uncertainty relation and natural line width and natural line broadening, transition probability, selection rules, intensity of spectral lines, Born-Oppenheimer approximation, rotational, vibrational and electronic energy levels.

**Paper – Lab Course - I**

- CO 1. Students have hands-on experience in the qualitative analysis of mixture containing 8 radicals including 2 less common metals from among the following by semimicro method.
- CO 2. Quantitative separation and determination of the following pairs of metal ions using gravimetric and volumetric methods
- CO 3. Estimation and preparation of selected inorganic compound and their studies. Handling of air and moisture sensitive compounds.

**Paper – Lab Course – II**

- CO 1. Experiments have been designed which make use of the concepts of surface chemistry, phase equilibria, chemical kinetics, solutions and molecular weights.



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CO 2. Students get hands on experience in use of various instruments such as conductometry, pH-metry, potentiometry and polarimetry.

CO 3. It able to understand the theoretical concepts.

CO 4. To learn viscosity, surface tension etc.

**Course Outcomes (COs)**

**Second Semester**

**Paper – Inorganic Chemistry – II**

CO 1. To develop the understanding of basic concepts of mechanism involved in substitution and electron transfer reactions of transition metal complexes.

CO 2. Introduction of structural features of metal carbonyls, inorganic rings, chains and clusters especially boranes and heteroboranes.

**Paper – Organic Chemistry – II**

CO 1. To understand various addition reaction to carbon-carbon double bonds, elimination reaction with mechanism and understanding of the theoretical basis for pericyclic reactions and skills for the utilization of these reactions in the organic synthesis.

CO 2. To understand the basics of photochemistry- excitation of molecules by light, various photochemical reactions and the photochemistry of Alkenes and Carbonyl compounds.

**Paper – Physical Chemistry – II**

CO 1. To learn Angular Momentum in quantum mechanics, variation and perturbation theory, statistical thermodynamics.

CO 2. Theory of semiconductor-electrolyte interfaces, Butler-Volmer equation.

CO 3. Chemical dynamics-study of fast reactions, theory of unimolecular reaction.

CO 4. Study of corrosion and cyclic voltammetry.

**Paper – Theory and Application of Spectroscopy –II**

CO 1. To learn about UV and Visible spectroscopy, Electronic spectroscopy, Mass spectroscopy, NMR spectroscopy and their applications in structure elucidation.

**Paper – Lab Course - I**

CO 1. Students have hands-on experience in the general methods of separation and purification of organic compounds with special reference to: solvent extraction, fractional crystallization and distillation techniques.

CO 2. Separation and identification of organic binary mixtures containing at least one component with two substituents.



**Office of The Principal**  
**Nayak Nityanand Sai Govt. College Aara Dist. – Jashpur (CG)**

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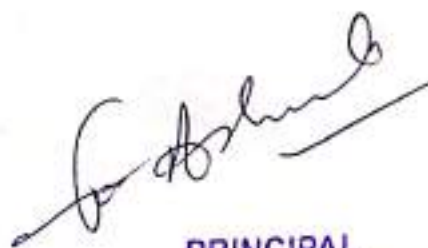
Date -28/11/2024

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**CO 3.** Preparation of organic compounds: single step reparations such as Aldol, Cannizzaro, Fridel Craft reaction, Grignard, Perkin's, Sandmeyer reaction etc.

**Paper - Social Out Reach & Skill Development Field Work**

**CO 1.** The aim of the project work of field work is to introduce students with the research methodology in the subject and to prepare them for pursuing research in theoretical experimental or computational area of subject.



**PRINCIPAL**

Nayak Nityanand Sai Govt. College Aara  
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