



GOVT. DR. INDRAJEET SINGH COLLEGE, AKALTARA

DIST. JANJGIR-CHAMPA (C.G.), Web site- www.gdiscakaltara.in/ Email ID- gdiscakaltara@gmail.com /Phone- 07817-252540

DEPARTMENT OF MATHEMATICS (BSc)

COURSE OUTCOME

SN	Name Of Course	Name Of Sub./Paper	Course Outcome
1	B.Sc. 1st	Algebra & Trigonometry - 1	<ol style="list-style-type: none"> To Give The Student Of First-Hand Knowledge Of Matrix. To Develop In Students Application Of Linear Equation . To Give Knowledge Of Major Mathematics Of Their Contribution. To Give The Students On Knowledge Of Mappings And Homomorphism. To Understand Permutation Group. Knowledge Of Trigonometrical Functions. Understand Group And Its Properties.
2	B.Sc. 1st	Elementary Calculus - 2	<ol style="list-style-type: none"> Knowledge Of Limit Of Function Asymptotes. Understand Of Curvature & Tracing Of Curves. Understand Of Integration Of Transcendental Functions. Knowledge Of Degree And Order Offer Differential Equation. Knowledge Of Linear Differential Equation.
3	BSc. I	Vector Analysis & Geometry - 3	<ol style="list-style-type: none"> Knowledge Of Is Scalar And Vector Product. Understand Vector Integration In Theorem Of Gauss And Green Stocks. Understand System Of Conics And Polar Equation Of Conic. Understand Plane, Sphere And Cone.
4	BSc. II	Advanced Calculus - 1	<ol style="list-style-type: none"> Understand Sequence And Series. Understand Continuity Of Function And It's Properties. Understand Beta And Gamma Functions And Its Theorem. Understand The Euler Theorem On Homogeneous Function. Understand Envelops Maxima And Minima Lagrange's Multiplier Method.
5	BSc. II	Differential Equation - 2	<ol style="list-style-type: none"> Understand The Power Series Method Bessel And Legendre Functions. Understand Laplace Transformation And It's Existence Theorem. Understand The Lagrange's Solution And Charpit Method.

			<ol style="list-style-type: none"> Understand Variational Problem With Fixed Boundaries Eulers Equation For Functional Containing First Order Derivatives.
6	BSc. II	Mechanics - 3	<ol style="list-style-type: none"> Understand Equilibrium Of Coplanar Forces Stable And Unstable Equilibrium And Virtual Work. Understand Forces In Three Dimensions Poinsot's Central Axis And Null Lines And Planes. Knowledge Of Simole Harmonic Motion And Hooke's Law. Understand Velocities And Acceleration Along Radial And Transverse Directions. Knowledge Of Kepler's Law Of Motion (Planetary Motion).
7	BSc. III	Analysis - 1	<ol style="list-style-type: none"> To Give The Student A First Hand Knowledge Of Series Of Arbitrary Term Double Series And Implicit Function. Understand The Riemann Integral And The Fundamental Theorem Of Integral Calculus. Knowledge Of Matric Space And Limit Points. Understand Complex Numbers As Ordered Pair And Analytic Function. Understand Baire Category Theorem And Extension Theorem.
8	BSc. III	Abstract Algebra - 2	<ol style="list-style-type: none"> To Give The Student A Knowledge Of Group Automorphism A Normalizer. Understand Ring Theory And Homomorphism And Isomorphism Theorem. To Give The Student A Knowledge Of Vector Space And Their Basic Properties Basis. To Give The Student A Knowledge Of Linear Transformation And Diagonalization. Understand Inner Product Space And Cauchy Schwarz Inequality.
9	BSc. III	Discrete Mathematics - 3	<ol style="list-style-type: none"> Understand Phrase Structure Grammars And Languages. Knowledge Of Relation And Function Graph. Understand Finite State Machine And Equivalent Machine. Understand Recurrence Relation And Homogeneous. Understand Boolean Algebra (Lattice) And Boolean Function Knowledge Of Switching Circuits.



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College Code- 3003

DEPARTMENT OF MATHEMATICS (MSc)

COURSE OUTCOME

SN	Name Of Course	Name Of Sub./Paper	Course Outcome
1	M.Sc. 1st, 2 nd SEM.	Advanced Abstract Algebra - 1	<ol style="list-style-type: none"> 1. Understand Permutation Group, Isomorphism Theory. 2. Understand Normal Series, Solvable Group And Jordan-Holder Theorem. 3. Understand Rings and Modules Zorn's Lemma. 4. Understand Modules, Vector Space and Rank Nullity Theorem . 5. Understand Field Theory, Neotherian and Artinian Modules.
2	M.Sc. 1st, 2 nd SEM.	Real Analysis - 2	<ol style="list-style-type: none"> 1. Understand The Riemann Stieljes Integral and Fundamental Theory Of Calculus. 2. Understand Function Of Several Variable (Linear Transformation). 3. Understand Sequence and Series Of Function and Its Theorem . 4. Understand Power Series and Abel's Theorem. 5. Understand Measurable Sets and Functions Riesz Theorem. 6. Understand Lebesque Integral and Lebesque LP Spaces.
3	M.Sc. 1st, 2 nd SEM.	Topology - 3	<ol style="list-style-type: none"> 1. Understand Topological Spaces, Closed Sets. 2. Understand Separation Axioms and Its Basic Properties. 3. Understand Countable Spaces and Tietz Extension Theory. 4. Understand Compactness and Its Basic Properties. 5. Understand Connected Spaces and Connectedness (Tychonoff's Theorem).
4	M.Sc. 1st, 2 nd SEM.	Complex Analysis - 4	<ol style="list-style-type: none"> 1. Understand Complex Integration, Cauchy Goursat Theorem And Cauchy's Integral Formula. 2. Understand Meromorphic Functions and Inverse Function Theorem. 3. Understand Residues and Cauchy Residue Theorem. 4. Understand Bilinear Transformation, Their Properties and Classification. 5. Understand Entire Functions, Gamma Function and Its Properties. 6. Understand Canonical Product and Jensen's Formula.
5	M.Sc. 1st, 2 nd SEM.	Advanced Discrete Mathematics - 5	<ol style="list-style-type: none"> 1. Knowledge Connectives, Truth Table and Tautology. 2. Knowledge Algebraic Structure and Basic Homomorphism Theorem. 3. Understand Lattices(Posets) and It's Properties .

			<ol style="list-style-type: none"> 4. Understand The Karnaugh Map Method. 5. Understand Grammar and Language Finite State Machines. 6. Knowledge Graph Theory, Degree Of Vertex and Trees.
6	M.Sc. 3rd, 4th Sem.	Integration Theory & Functional Analysis - 1	<ol style="list-style-type: none"> 1. To Give The Student a First-Hand Knowledge Of Signed Measure, Hahn Decomposition Theory. 2. To Provide Them With Knowledge Of Inner Product Spaces, Orthonormal Sets, Bessel's Inequality . 3. To Develop In Student The Basic Knowledge Of Uniform Boundedness Theorem . 4. To Give The Students a Knowledge Of Lebesque Stieltjes Integral, Product Measure and Hausdorff Measure .
7	M.Sc. 3rd, 4th Sem.	Partial Differential Equation	<ol style="list-style-type: none"> 1. Understand Fundamental Solution Of Laplace's Equation, Mean Value Theorem and Properties Of Harmonic Function. 2. Understand Heat Equation, Mean Value Formulae and Properties Of Solution. 3. Understand Laplace and Fourier Transforms and Their Application . 4. Understand Hamilton Canonical Equations and Routh's Equations. 5. To Give The Students Knowledge Of Potential Of Rod, Spherical Shell, Surface and Solid Harmonics .
8	M.Sc. 3rd, 4th Sem.	Fuzzy Sets & Their Application - 3	<ol style="list-style-type: none"> 1. Understand Fuzzy Sets α - Cut and Basic Properties On Fuzzy Sets . 2. To Give The Student a First-Hand Knowledge Of Fuzzy Numbers and Fuzzy Equation . 3. Knowledge Of Fuzzy Relation Of Fuzzy Sets and Fuzzy Morphism. 4. Understand Possibility Theory - Fuzzy Measure. 5. Knowledge Of Fuzzy Control Controllers Fuzzyfication. 6. To Develop In Students Decision Making In Fuzzy Environment, Individual Decision Making.
9	M.Sc. 3rd, 4th Sem.	Operation Research - 4	<ol style="list-style-type: none"> 1. Understand Operation Research and Its Scope . 2. Knowledge Of Simplex Method and Big M Method Of Solution To LPP. 3. Understand Network Analysis - Shortest Path Problem and Maximum Flow / Problem. 4. Knowledge Of Game Theory - Two Person and Games With Mix Strategies. 5. Understand Of Queuing System Deterministic Queuing System.
10	M.Sc. 3rd, 4th Sem.	Fluid Mechanics	<ol style="list-style-type: none"> 1. Understand Kinematics - Lagrangian and Eulerian Method. 2. Understand Equation Of Motion - Euler's Dynamical Equation and Incompressible Fluids. 3. Understand Languages Stream Function and Stoke's Stream Function. 4. Understand Vortex Motion and Its Properties Energy Of Progressive Waves.



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DEPARTMENT OF ZOOLOGY (BSc)

Sl. No.	Name of Course	Semester	Name of Subject	Course Outcome
1	BSc	Part-1	Cell Biology	1. On completion of the course, students are able to 2. Understand the scope of cell biology, because cell is the basic unit of life. 3. Understand the Main distinguishing characters between plant cell and animal cell. 4. To study and understand the whole cell organisms with their structure and function. 5. Understand the cell cycle and know the importance of various cells in body of organisms. 6. Understand the various applications of cells by using cell biology like study of various types of tumor.
2	BSc	Part-1	Non-Chordata	1. Understand about the Non-Chordate animals. 2. To study the external as well as internal characters of non-chordates. 3. To study the distinguishing characters of non-chordates. 4. Understand the economical importance of Mollusca. 5. Understand the Characters of class Arterias with help of animal sea slug. 6. Understand the internal as well as external morphology of that animal. 7. To study and understand the concepts: Metamorphosis, regeneration and aestivation. 8. Understand the Molluscan eye. 9. Understand the Canal system in sponges. 10. Understand the Locomotion in Protozoa. 11. To observe and study the Pupa in Mollusca.
3	BSc	Part-1	Chordata	1. Understand the phylum Chordata. 2. Understand the evolution, history of phylum. 3. Understand the evolution, history of phylum. 4. Understand the basic concepts about chordates. 5. Understand the external morphology and sexual dimorphism in chordates. 6. Study and understand the various systems, adaptations and distribution in Mammals.
4	BSc	Part-1	General Embryology	1. Identify the developmental stages. 2. Describe the key events in early and systematic embryological development. 3. Describe the process of gametogenesis. 4. Describe the chick development up to 96 hours of incubation and extra embryonic membranes. 5. Explain the factors of periconation, and concepts like growth, differentiation and reproduction. 6. Explain the principles and process of fertilization and cleavage. 7. Prepare the flow chart of gametogenesis process. 8. Identify the 100 cycle stages of <i>Leucon</i> parasitism.
5	BSc	Part-1	Practical Paper	1. Identify and explain the cleavage blastula and gastrulae. 2. Identify the age of chick embryo. 3. Identify the phases of cell division. 4. List the household Pests and social insects. 5. Explain the pathogenecity and morphology of few organisms. 6. Explain the transmission of insects and human with examples. 7. Explain the diseases spread by vectors. 8. Explain the interrelationship of insects and human with examples. 9. Explain the effects of household insects on human health. 10. Demonstrate social parasitism in cockroach. 11. Demonstrate Metamorphic stages and aestivation.

Sl. No.	Name of Course	Semester	Name of Subject	Course Outcome
6	BSc	Part-2	Structure and Function of Vertebrates	1. Understand the classes of vertebrates: fishes, Amphibians, Reptiles, Aves and Mammals. 2. Study of endocrinology of vertebrates. 3. Comparative Study of skin of vertebrates. 4. Understand the comparative account of organ system, nervous system, digestive system heart and aortic arches and its evolution in vertebrates. 5. Understand the physiology of nerve impulse and signaling mechanism and digestion.
7	BSc	Part-2	Vertebrate endocrinology and reproductive biology	1. Define endocrine glands and hormones. 2. Understand the general idea about hormone roles in animal body. 3. Understand the types of hormones, synthesis, secretion and its function. 4. Understand the mechanism of hormone action and its termination. 5. Understand the reproductive system of animal and its function. 6. Understand the role of hormone in animal reproduction and reproductive cycle. 7. Understand the disease and disorder of imbalance of hormones. 8. Reproductive behavior in animal like courtship pattern.
8	BSc	Part-2	Ecology	1. Define the term ecological behavior. 2. Understand the reproductive behavior in animals. 3. Understand about orientation behavior in animals. 4. Understand about drug, hormones and behavior.
9	BSc	Part-2	Organic Evolution	1. Define organic evolution. 2. Explain the theories of organic evolution. 3. Describe the concept of origin of life and theories of origin of life. 4. Describe evolution of horse. 5. Illustrate the presence of organisms at various geological time scale. 6. Apply the knowledge in relevant experiments. 7. Categorize different zoogeographical realms. 8. Compare animal distribution in different zoogeographical realms.
10	BSc	Part-2	Applied Zoology	1. Introduce the term apiculture to the students. 2. To aware the students and provide the economical importance of Apiculture. 3. Understand the bee keeping equipments and apiculture management. 4. To study and understand the various species of Bees.
11	BSc	Part-2	Practical Paper	1. Identify the organs by studying the histological slides. 2. Identify hormonal disorders using pictures. 3. Explain the anatomical features of brain, heart, kidney and skin of vertebrates. 4. Explain the anatomical features of brain, heart, kidney and skin of vertebrates. 5. Identify the fossil types/ adaptations in animals. 6. Explain the evidences of evolution. 7. Identify the age of chick embryo. 8. Illustrate the social organization in insects.

Sl. No.	Name of Course	Semester	Name of Subject	Course Outcome
12	BSc	Part-3	Environment I Biology & Technology	1. List the environmental challenges and their remedies. 2. Describe the nature of ecosystem, production, food web, energy flow. 3. Describe the resilience of ecosystem and ecosystem management. 4. Explain Biosphere, Biome and impact of Climate on Biome. 5. Explain wildlife management in India and conservation of wildlife. 6. Explain the three necessary and sufficient conditions i.e. struggle for existence, variation, and inheritance. 7. Illustrate the toxic effects of chemicals in the environment on human and his. 8. Invertebrate. 9. Discuss natural resources, causes of their depletion and their conservation.
13	BSc	Part-3	Microbiology	1. Understand about general and applied microbiology. 2. Use of microbes to making the useful product in industry. 3. Microbiology of domestic water and sewage.
14	BSc	Part-3	Medical Microbiology	1. Define the term parasitology. 2. List various ectoparasites and endoparasites. 3. Explain animal associations and their types. 4. Discuss the life cycle and importance of major parasites. 5. Illustrate transmission routes of animal and zoonotic parasites. 6. Classify parasites. 7. Justify the control measures of arthropod vectors. 8. Compare the importance of hygiene with respect to zoonotic diseases.
15	BSc	Part-3	Genetics & Molecular biology	1. Define the basic terms in genetics. 2. Discuss the linkage groups and gene frequency. 3. Explain the concepts of mutation. 4. Penetrate the Central dogma of molecular biology. 5. Illustrate the mechanisms of replication, transcription and translation.
16	BSc	Part-3	Biological Chemistry	1. Define the basic terms in biochemistry. 2. Explain the structure, functions and reactions of the various biomolecules. 3. Give examples of each group type of biomolecules. 4. Correlate the changes in the levels of these biomolecules with the diseases in human. 5. Calculate pH and pOH of buffer solution. 6. Classify the biomolecules. And enzymes. 7. Draw the structures of major biomolecules.
17	BSc	Part-3	Biological techniques	1. Describe the techniques used in biotechnology. 2. Explain the principle of separation techniques. 3. Illustrate the working of microscopes. 4. List the separation techniques. 5. Demonstrate the principle, working, application of centrifugation.
18	BSc	Part-3	Practical Paper	1. Count total bacteria from blood samples. 2. Estimate the IBU level in blood samples. 3. Measure the pH of green samples. 4. Identify the life cycle stages of few parasites. 5. Explain the pathogenecity and morphology of few organisms. 6. Explain the importance and applications of techniques in biotechnology.



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DEPARTMENT OF CHEMISTRY (BSc)

SN	CLASS	PAPER	COURSE OUTCOME
1	BSc I	INORGANIC CHEMISTRY	CO1. Knowledge of atomic structure and periodic properties of elements. CO2. Understand various types of bonding in covalent molecules and ions. CO3. Understand various types of bonding in ionic solids. Programme Specific Outcome and can open up new Methods for environmental pollution control. CO4. Comparative knowledge of s-block elements of periodic table and their compounds. Chemistry of noble gases. CO5. Comparative knowledge of s-block elements of periodic table and their compounds. Chemical principles involve in inorganic chemical analysis.
2	BSc I	ORGANIC CHEMISTRY	CO1. Knowledge of electronic structure, bonding and mechanisms of organic reactions. CO2. Knowledge of stereochemistry of organic compounds. CO3. Understand Chemistry of aliphatic and aromatic ring compounds. CO4. Understand Chemistry of alkenes, dienes and alkynes. CO5. Understand Chemistry of amines and aromaticity.
3	BSc I	PHYSICAL CHEMISTRY	CO1. Understand the idea of mathematical concepts for chemists and basic knowledge of computer. CO2. Knowledge of various types of molecular velocities and their effect on properties. Understand behaviour of ideal gases. CO3. Understand intermolecular forces in liquid state, ideal and non ideal solutions, properties of dilute solutions. CO4. Understand structure, properties and uses of liquid crystals. Colloidal states and its properties and uses. CO5. Understand chemical kinetics rate constant and order of reactions and various theories. Characteristics types and industrial applications of catalysis.
4	BSc I	Practical work	CO1. Analyse quantitatively acid and basic radicals by micro-analysis method. CO2. Calibration of thermometers. CO3. Determination of melting point and boiling point of organic compounds. CO4. Mixed melting point determination. CO5. Crystallization. CO6. Decolorization and crystallization using charcoal. CO7. Sublimation. CO8. Detection of Nitrogen, Sulphur and Halogens and detection of functional group present in organic compounds. CO9. To determine specific rate of hydrolysis of methyl(methyl) acetate catalyzed by hydrogen ion at room temperature. CO10. To study distribution of iodide between water and carbon tetrachloride. CO11. To determine the % composition of a given mixture by viscosity method.
5	BSc II	INORGANIC CHEMISTRY	CO1. Understand chemistry of first transition series elements. CO2. Understand chemistry of second and third transition series elements. CO3. Understand Oxidation and reduction. Coordination compounds. CO4. Understand chemistry of boronhydrides and azides. CO5. Understand Acid and bases and non-aqueous solvents. CO6. Understand Chemistry of alcohols, phenols and epoxides. CO7. Understand chemistry of aldehydes and Ketones and its uses.
6	BSc II	ORGANIC CHEMISTRY	CO1. Understand chemistry of first transition series elements. CO2. Understand Chemistry of organic compound of nitrogen. CO3. Understand Chemistry of heterocyclic compounds and amino acids & peptides.

7	BSc II	PHYSICAL CHEMISTRY	CO1. Understand first law of thermodynamics and thermochemistry. CO2. Understand second law of thermodynamics, efficiency of a heat engine and concept of entropy. CO3. Understand phase equilibrium, Gibbs rule, and application of phase rule to two component systems and three component systems and Raoult distribution law. CO4. Understand electrolytic conductivity, theories of strong electrolytes and migration of ions. CO5. Understand electrochemical cell or galvanic cell, single electrode potential, concentration cell, pH and its determination and corrosion.
8	BSc II	Practical work	CO1. Calibration of fractional weights, pipettes and burettes. CO2. Preparation of standard solutions. CO3. Quantitative volumetric estimation of oxalic, tartaric, malic, tartaric, citric, hardness of water, ferrous & ferric and copper. CO4. Colorimetry: Job method and ratio method. CO5. Adsorption: in food stuffs. CO6. Effluent analysis. CO7. Water analysis. CO8. Solvent extraction-separation and estimation of Mg and Fe. CO9. Ion exchange method; separation and estimation of Mg and Zn. CO10. Thin layer chromatography: Determination of Rf value and identification of organic compounds. CO11. Paper chromatography Ascending and circular. CO12. Determination of Rf value and identification of organic compounds. CO13. Qualitative analysis: identification of an organic compound. CO14. Determination of the transition temperature of given substance by thermometric/dilatometric method. CO15. To study of a solute on the critical solution temperature of two partially miscible liquids. CO16. Construct the phase diagram of two component system by cooling curve method. CO17. Determine the solubility of benzoic acid at different temperatures. CO18. Determine the enthalpy of neutralization and ionization.
9	BSc III	INORGANIC CHEMISTRY	CO1. Understand metal ligand bonding in transition metal complexes. Thermodynamics and kinetic aspects of metal complexes. CO2. Understand magnetic properties of transition metal complexes and electronic spectra of complexes. CO3. Understand chemistry of organometallic compounds. CO4. Understand bioinorganic chemistry. CO5. Understand hard and soft acids and bases and silicates and phosphates. CO6. Understand chemistry of organometallic compounds, organosulfur compounds and organic synthesis via metathesis. CO7. Understand bioinorganic chemistry. CO8. Understand hard and soft acids and bases and silicates and phosphates. CO9. Understand chemistry of organometallic compounds, organosulfur compounds and organic synthesis via metathesis. CO10. Understand bioinorganic chemistry. CO11. Understand Chemistry of synthetic polymers and
10	BSc III	ORGANIC CHEMISTRY	CO1. Understand chemistry of carboxylic acid, substituted carboxylic acids and their derivatives. CO2. Understand Chemistry of organic compound of nitrogen. CO3. Understand Chemistry of heterocyclic compounds and amino acids & peptides.

11	BSc III	PHYSICAL CHEMISTRY	CO1. Understand Quantum Mechanics black body radiation, DeBroglie's idea of matter waves, Schrödinger wave independent wave equation and its applications. CO2. Understand quantum mechanical approach to molecular orbital theory, Orbitals and their characteristics. CO3. Understand Vibrational and Raman spectra. CO4. Understand Third law of thermodynamics, Normal function and its application. Physical property and molecular structure. Magnetic properties. CO5. Understand of chemical kinetics rate constant and order of reactions and various theories. Characteristics types and industrial applications of catalysis.
12	BSc III	Practical work	CO1. Synthetic analysis of sodium thiosulfate (II). CO2. Preparation of Ni-DMG. CO3. Preparation of Copper vers ammine complex. CO4. Preparation of cis- and trans-bis(oxalato) diaqua chromate (II). CO5. Gravimetric analysis of Cu as CuSO ₄ ·Ni as NiSO ₄ ·Ba as BaCl ₂ ·Fe as Fe ₂ O ₃ . CO6. Steam distillation: Naphthalene from its suspension in water. Chloroform from clove. Separation of ortho and para-isomers. CO7. Separation of barium and calcium by column chromatography. CO8. Separation of lead pigments from Spanish lead by column chromatography. CO9. Resolution of racemic mixture of (+)-malic acid by column chromatography. CO10. Analysis of an organic mixture containing two acid components. CO11. Acetylation of salicylic acid, malic, glucose and hydroquinone. CO12. Determination of aniline and phenol. CO13. Preparation of m-dinitrobenzene, p-nitroaniline, 2,4,6-trinitrophenol. CO14. Preparation of methyl orange and methyl red. CO15. Preparation of benzoic acid from salicylate. CO16. Preparation of salicylic from salicylates, preparation of racemic aniline from m-dinitrobenzene. CO17. Determine strength of given acid conductometrically using standard alkali solution. CO18. Study of specification of ethyl acetate conductometrically. CO19. Determine the specific rotation of a given optically active compound. CO20. Determination of molecular weight of a non-volatile solute by Raoult method/ Beckmann freezing point method. CO21. Verify Beer-Lambert law for KMnO ₄ , K ₂ Cr ₂ O ₇ and determination of concentration of the given solution of the solution.



प्रयोगशाला में

1. प्रयोग प्रारंभ करने के
2. कार्य की मेज साफ हो
3. अभिकर्मक बोतलों को
4. आत्मविश्वास और धैर्य
5. समस्त प्रेक्षणों को प्राय
6. प्रेक्षणों को अंकित कर
7. विद्यार्थी के प्रेक्षण न
8. प्रयोग करते समय जो
9. अभिकर्मकों की उचित
10. मात्रा में अभिकर्मक के
11. उपयोग न होने की स्थि
12. रसायनों से खिलवाड़ न
13. प्रयोगशाला में शांति व
14. किसी भी स्थिति में शं
15. आपस में अनावश्यक
16. छोटी-बड़ी कोई भी दु
17. प्राथमिक उपचार ले



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DEPARTMENT OF BOTANY (BSc)

SN	CLASS	PAPER	COURSE OUTCOME
1	BSc I	1st: Bacteria, Viruses, Fungi, Lichens and Algae	On completion of this course students will be able to <ul style="list-style-type: none"> To gain knowledge about microbial diversity. To understand about range of thallus structure of algae, fungi and lichen and their occurrence. To know about life cycles of different algal and fungal spp. To gain knowledge about economic importance of bacteria, viruses, algae, fungi and lichens.
2	BSc I	2nd: Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany	<ul style="list-style-type: none"> To understand about occurrence, structure and reproduction in bryophytes. To know the evolution of sporophytes in bryophytes. To gain knowledge about stellar evolution and seed formation habit in pteridophytes. To understand about occurrence, structure and life cycles of pteridophytes. To gain knowledge about distribution, structure and life cycles of gymnosperms. To know about economic importance of bryophytes, geological time scale, fossils and fossilization, pteridophytes and gymnosperms. To understand about geological time scale, fossils and fossilization.
3	BSc I	Practical	<ul style="list-style-type: none"> To have the knowledge of study of morphology, anatomy of algae, fungi, bryophyte, gymnosperm. To know the technique of identification of plant disease symptoms. Gain knowledge of anatomy of some gymnosperms.
4	BSc II	1st: Plant Taxonomy, Economic Botany, Plant Anatomy and embryology	<ul style="list-style-type: none"> To know about Bentham and Hooker's system of Classification To understand about IUCN, Typification, numerical taxonomy chemotaxonomy, Herbaria and Botanical gardens. To gain knowledge about some important plant families. To explore the uses of plants as cereal, vegetable, oil, timber, spices, medicines, beverages, biodiesel plants. Also know about cultivation of important flowers and Ethnobotany of CG. To understand about plant root and stem structure, RAM, SAM organization, secondary

			growth and anatomical anomalies. <ul style="list-style-type: none"> To know the structure of a flower and its different parts. To get introduced to male and female gametophyte development, pollination, self-incompatibility, fertilization, endosperm and embryo development, polyembryony, apomixis and parthenocary.
5	BSc II	2nd Ecology and Plant Physiology	<ul style="list-style-type: none"> To have knowledge of Ecology and its scope, understand different ecological factors, soil formation and soil profile. To understand Liebig's law of minimum, Shelford's law of tolerance, morphological and anatomical adaptations in hydrophytes, xerophytes and epiphytes. To know about population and community characteristics, population interactions. To understand about succession, ecotone, edge effect, ecotypes, ceads keystone species. To have knowledge of energy flow in ecosystem, food chain, food web and ecological pyramids and biogeochemical cycles To understand osmosis, water absorption, mineral nutrition, transpiration photosynthesis and respiration. To gain knowledge of Plant growth hormone and mechanisms of flowering. To know photoperiodism, vernalization, seed dormancy, germination and plant movement.
6	BSc II	Practical	<ul style="list-style-type: none"> To get knowledge of study of some important plants in semi-technical language with their classification and identification. To know about morphology and anatomy of root, stem, and leaves with the help of prepared slides. To know the structure of flower. To know the technique of study of ovules, placentation, embryo with the help of slides. To know about some experiments of osmosis, transpiration, photosynthesis, respiration. To have knowledge of studying of a community by quadrat method. To know about structure of ecosystem. Study of some economically important plants.
7	BSc III	1st: Plant Physiology,	<ul style="list-style-type: none"> To understand osmosis, water absorption, mineral nutrition in plants.

		Biochemistry and Biotechnology	<ul style="list-style-type: none"> To have knowledge about photosynthesis and respiration. To gain knowledge of how light and temperature affects flowering in plants. To get introduced to the structure of phytochrome, cryptochrome and phototropin. To know the mechanism of nitrogen fixation in plants. To understand about different types of plant movements. To gain knowledge of mechanism of action of enzymes. To have knowledge about seed dormancy. To know the main techniques of genetic manipulation and plant tissue culture.
8	BSc III	2nd: Ecology and Utilization of plants	<ul style="list-style-type: none"> To understand different ecological factors. To understand ecological relationship between organisms and their environment. To know about plant community and its development. To have knowledge of ecosystem, food chain, food web and ecological pyramids. To know about different biogeographical regions of India. To explore the uses of plants as cereal, vegetable, oil, timber, spices and medicines.
9	BSc III	PRACTICAL	<ul style="list-style-type: none"> To know about some experiments of osmosis, transpiration, photosynthesis, respiration. To know the technique of identification of carbohydrates, lipids and proteins To have knowledge of studying of a community by quadrat method. To know about structure of ecosystem. Study of some economically important plants.
10	MSc I SEM	1st: Biology and Diversity of Virus, Bacteria and Fungi	On completion of this course students will be able to <ul style="list-style-type: none"> Acquire the knowledge of history and development of Virology, Bacteriology and Mycology. Develop an understanding of classification, nomenclature, distribution of microbes. Understand the life cycle pattern and economic importance of microorganisms. Learn the phylogeny and evolutionary concepts in lower group of organisms.



GPS Map Camera



Akaltara, Chhattisgarh, India

2C9P+4M3, near Dr . indrajeet singh college ke pass, Akaltara, Chhattisgarh

495552, India

Lat 22.0176°

Long 82.436613°

18/04/24 12:14 PM GMT +05:30

Google

safety



Always wear safety goggles when working in the lab.



No food or drinks in the lab.



your eyes, use on to clean them.



Always wear safety gloves when working in the lab.



RY) 3RD SEMESTER
MA, DURGESH



GOVT. DR. INDRAJEET SINGH COLLEGE, AKALTARA

DISTT. JANJIR-CHAMPA (C.G.), Web site- www.gdiscakaltara.in/ Email ID- gdiscakaltara@gmail.com / Phone- 07817-252540

College Code- 3003

DEPARTMENT OF CHEMISTRY (MSc)

SN	CLASS	PAPER	COURSE OUTCOME
1	MSc I SEM	INORGANIC CHEMISTRY	CO1. Understand nomenclature and bonding in main group compounds. CO2. Understand metal ligand bonding. CO3. Understand electronic spectra of transition metal complexes. CO4. Understand magnetic properties of transition metal complexes. CO5. Understand symmetry and matrix representation. CO6. Understand group theory in chemistry.
2	MSc I SEM	ORGANIC CHEMISTRY	CO1. Understand reaction mechanisms. CO2. Understand nature of bonding in organic molecules. CO3. Understand stereochemistry. CO4. Understand reaction mechanisms: structure and reactivity. CO5. Understand pericyclic reactions. CO6. Understand molecular rearrangement. CO7. Understand retrosynthetic analysis.
3	MSc I SEM	PHYSICAL CHEMISTRY	CO1. Understand introduction to exact quantum mechanical models. CO2. Understand approximate methods and angular momentum. CO3. Understand electronic structure of atoms. CO4. Understand molecular orbital theory. CO5. Understand chemical dynamics. CO6. Understand surface chemistry. CO7. Understand macromolecules.
4	MSc I SEM	Laboratory Course-I ORGANIC CHEMISTRY	CO1. Separation, purification and identification of binary organic mixtures. CO2. Organic synthesis based on various reactions. CO3. Quantitative estimation of various organic compounds. CO4. Understand metal ligand equilibria in solution. CO5. Understand reaction mechanism of transition metal complexes. CO6. Understand metal clusters. CO7. Understand metal carbonyls and metal nitrosyls. CO8. Understand isopoly and heteropoly acid salt synthesis. CO9. Understand aliphatic electrophilic substitution. CO10. Understand aromatic nucleophilic substitution. CO11. Understand aromatic electrophilic substitution. CO12. Understand free radical reaction. CO13. Understand addition to carbon-carbon multiple bond. CO14. Understand addition to carbon-hetero multiple bonds. CO15. Understand elimination reactions.
5	MSc II SEM	INORGANIC CHEMISTRY	CO1. Understand metal ligand equilibria in solution. CO2. Understand reaction mechanism of transition metal complexes. CO3. Understand metal clusters. CO4. Understand metal carbonyls and metal nitrosyls. CO5. Understand isopoly and heteropoly acid salt synthesis. CO6. Understand aliphatic electrophilic substitution. CO7. Understand aromatic nucleophilic substitution. CO8. Understand aromatic electrophilic substitution. CO9. Understand free radical reaction. CO10. Understand addition to carbon-carbon multiple bond. CO11. Understand addition to carbon-hetero multiple bonds. CO12. Understand elimination reactions.
6	MSc II SEM	ORGANIC CHEMISTRY	CO1. Understand reaction mechanisms. CO2. Understand nature of bonding in organic molecules. CO3. Understand stereochemistry. CO4. Understand reaction mechanisms: structure and reactivity. CO5. Understand pericyclic reactions. CO6. Understand molecular rearrangement. CO7. Understand retrosynthetic analysis.
7	MSc II SEM	PHYSICAL CHEMISTRY	CO1. Understand introduction to exact quantum mechanical models. CO2. Understand approximate methods and angular momentum. CO3. Understand electronic structure of atoms. CO4. Understand molecular orbital theory. CO5. Understand chemical dynamics. CO6. Understand surface chemistry. CO7. Understand macromolecules.
8	MSc II SEM	SPECTROSCOPY, DIFFRACTION MICROSCOPY & COMPUTER FOR CHEMISTS	CO1. Understand atomic spectroscopy. CO2. Understand molecular spectroscopy. CO3. Understand photo electric spectroscopy. CO4. Understand Non-linear magnetic resonance spectroscopy. CO5. Understand Electron spin resonance spectroscopy. CO6. Understand photo acoustic spectroscopy. CO7. Understand X-ray diffraction. CO8. Understand computer fundamentals. CO9. Understand programming in C. CO10. Understand programming in chemistry and use of computer programmes.
9	MSc II SEM	Laboratory Course-II INORGANIC CHEMISTRY	CO1. Qualitative analysis of mixture containing eight radicals including some less common metal ions. CO2. Quantitative analysis involving two ions in alloys or mixture in solution- one by volumetric and other by gravimetric method. CO3. Quantitative Analysis- involving two of following in ores, alloys or mixture in solution- one by volumetric and other by gravimetric method: Ag, Cu, Pb, Cr, Mn, Ni, Zn, Co, Mg, Chromite, Sulphite. CO4. Estimation of: (A) Phosphoric acid in Commercial carbon phosphoric acid. (B) Boric Acid in Borax. (C) Ammonium ion in Ammonium Salt. (D) Manganese in pyrite. (E) Available Chlorine, in bleaching powder. (F) H ₂ O in commercial sample. CO5. Preparation of selected inorganic compounds and study of their properties by various method including IR, Electronic Spectroscopy, ESR, Spinous, Magnetic susceptibility etc. (G) Vitamin D.

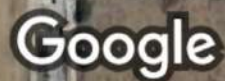
SN	CLASS	PAPER	COURSE OUTCOME
10	MSc II SEM	Laboratory Course-II PHYSICAL CHEMISTRY	CO1. Verification of Freundlich's Adsorption method. CO2. To study surface tension - concentration relationship for the solutions (Gibbs equation). CO3. Determination of congruent composition and temperature of binary system e.g. diphenyl ether - biphenylene system. CO4. Determination of glass transition temperature of given salt e.g. CaCl ₂ conductometrically. CO5. To construct phase diagram for three component system e.g. chloroform, acetic acid and water. CO6. Half-life of an ester: zinc acetate. CO7. Determination of the velocity constant of hydrolysis of an ester. Determination of effect of (i) change of temperature, (ii) change of concentration of reactants and (iii) of ionic strength of the media on the velocity constant of media. CO8. Determination of the rate constant for the oxidation of nitric oxide by hydrogen peroxide. CO9. Determination of the primary salt effect on the kinetics of bimolecular reaction and finding of the Brønsted relationship (validity may be verified by phosphate salt). CO10. Determination of solubility of sparingly soluble salt (e.g. BaSO ₄ , BaCO ₃) conductometrically. CO11. Determination of the strength of strong and weak acids in a given mixture conductometrically. CO12. Determination of dissociation constant of weak electrolyte by conductance. CO13. Determination of velocity constant, Order of reaction and energy of activation for Saponification of alkyl acetate by sodium hydroxide. CO14. Determination of the strength of strong and weak acid in a given mixture using pH meter/potentiometer. CO15. Determination of dissociation constant of weak acid by Potentiometry. CO16. Determination of concentration of lead in given buffer solution by pH meter. CO17. Determination of strength of halides in a mixture potentiometrically. CO18. Determination of the valency of inorganic ions potentiometrically. CO19. Determination of the strength of strong acid, weak acids in a given mixture using a potentiometer/ pH meter. CO20. Determination of temperature dependence of E _{mp} of a salt. CO21. Determination of the formation constant of silver-ammonia complex and stoichiometry of the complex potentiometrically. CO22. Determination of activity and activity coefficients of electrolytes. CO23. Determination of thermodynamic constant, ΔG, ΔH and ΔS for the reaction of Zn and H ₂ SO ₄ → ZnSO ₄ + H ₂ . CO24. Determination of the dissociation constant of monobasic / dibasic acid. CO25. Determination of rate constant for hydrolysis (inversion of sugar) using a polarimeter. Enzyme kinetic - inversion of sucrose. CO26. Determination of molecular weight of non-volatile and non-electrolyte electrolyte by cryoscopic method and to determine the activity coefficient of an electrolyte. CO27. Determination of the degree of dissociation of weak electrolyte and to study the deviation from ideal behaviour that occurs with a strong electrolyte.
11	MSc II SEM	APPLICATIONS OF SPECTROSCOPY (COMPULSORY)	CO1. Understand vibrational spectroscopy. CO2. Understand Electronic spin resonance spectroscopy. CO3. Understand Nuclear Magnetic Resonance of Paramagnetic substances in solution. CO4. Understand Ultraviolet and Visible Spectroscopy. CO5. Understand Nuclear Magnetic Resonance Spectroscopy. CO6. Understand Carbon 13 NMR Spectroscopy. CO7. Understand mass Spectrometry.

SN	CLASS	PAPER	COURSE OUTCOME
12	MSc III SEM	CHEMISTRY OF BIO-INORGANIC & BIOORGANIC (COMPULSORY)	CO1. Understand Metal ions in Biological Systems. CO2. Understand transport and storage of oxygen. CO3. Understand introduction of bioorganic chemistry. CO4. Understand nutrition. CO5. Understand kind of reactions catalyzed by enzymes. CO6. Understand co-enzyme chemistry. CO7. Understand enzyme models. CO8. Understand biochemical application of enzymes. CO9. Understand Kinetics and Acids of Transition Metals. CO10. Understand Transition Metal Complexes with Bonds to Hydrogen. CO11. Understand Transition Metal Compounds with Bonds to Hydrogen. CO12. Understand Kinetics of Organic Reactions. CO13. Understand Kinetics of Organic Reactions. CO14. Understand Kinetics of Organic Reactions. CO15. Understand Kinetics of Organic Reactions. CO16. Understand Kinetics of Organic Reactions. CO17. Understand Kinetics of Organic Reactions. CO18. Understand Kinetics of Organic Reactions. CO19. Understand Kinetics of Organic Reactions. CO20. Understand Kinetics of Organic Reactions.
13	MSc III SEM	ORGANOMETALLIC CHEMISTRY (Optional for group-A, Inorganic Chemistry)	CO1. Understand Kinetics of Organic Reactions. CO2. Understand Kinetics of Organic Reactions. CO3. Understand Kinetics of Organic Reactions. CO4. Understand Kinetics of Organic Reactions. CO5. Understand Kinetics of Organic Reactions. CO6. Understand Kinetics of Organic Reactions. CO7. Understand Kinetics of Organic Reactions. CO8. Understand Kinetics of Organic Reactions. CO9. Understand Kinetics of Organic Reactions. CO10. Understand Kinetics of Organic Reactions. CO11. Understand Kinetics of Organic Reactions. CO12. Understand Kinetics of Organic Reactions. CO13. Understand Kinetics of Organic Reactions. CO14. Understand Kinetics of Organic Reactions. CO15. Understand Kinetics of Organic Reactions. CO16. Understand Kinetics of Organic Reactions. CO17. Understand Kinetics of Organic Reactions. CO18. Understand Kinetics of Organic Reactions. CO19. Understand Kinetics of Organic Reactions. CO20. Understand Kinetics of Organic Reactions.
14	MSc III SEM	PHOTOCHEMISTRY & SOLID STATE CHEMISTRY (Optional for group-A, Inorganic Chemistry)	CO1. Understand Kinetics of Organic Reactions. CO2. Understand Kinetics of Organic Reactions. CO3. Understand Kinetics of Organic Reactions. CO4. Understand Kinetics of Organic Reactions. CO5. Understand Kinetics of Organic Reactions. CO6. Understand Kinetics of Organic Reactions. CO7. Understand Kinetics of Organic Reactions. CO8. Understand Kinetics of Organic Reactions. CO9. Understand Kinetics of Organic Reactions. CO10. Understand Kinetics of Organic Reactions. CO11. Understand Kinetics of Organic Reactions. CO12. Understand Kinetics of Organic Reactions. CO13. Understand Kinetics of Organic Reactions. CO14. Understand Kinetics of Organic Reactions. CO15. Understand Kinetics of Organic Reactions. CO16. Understand Kinetics of Organic Reactions. CO17. Understand Kinetics of Organic Reactions. CO18. Understand Kinetics of Organic Reactions. CO19. Understand Kinetics of Organic Reactions. CO20. Understand Kinetics of Organic Reactions.
15	MSc IV SEM	PHOTOCHEMISTRY & SOLID STATE CHEMISTRY (Optional for group-A, Inorganic Chemistry)	CO1. Understand Kinetics of Organic Reactions. CO2. Understand Kinetics of Organic Reactions. CO3. Understand Kinetics of Organic Reactions. CO4. Understand Kinetics of Organic Reactions. CO5. Understand Kinetics of Organic Reactions. CO6. Understand Kinetics of Organic Reactions. CO7. Understand Kinetics of Organic Reactions. CO8. Understand Kinetics of Organic Reactions. CO9. Understand Kinetics of Organic Reactions. CO10. Understand Kinetics of Organic Reactions. CO11. Understand Kinetics of Organic Reactions. CO12. Understand Kinetics of Organic Reactions. CO13. Understand Kinetics of Organic Reactions. CO14. Understand Kinetics of Organic Reactions. CO15. Understand Kinetics of Organic Reactions. CO16. Understand Kinetics of Organic Reactions. CO17. Understand Kinetics of Organic Reactions. CO18. Understand Kinetics of Organic Reactions. CO19. Understand Kinetics of Organic Reactions. CO20. Understand Kinetics of Organic Reactions.
16	MSc IV SEM	BIO-PHYSICAL & ENVIRONMENTAL CHEMISTRY (Optional for group-A, Inorganic Chemistry)	CO1. Understand Kinetics of Organic Reactions. CO2. Understand Kinetics of Organic Reactions. CO3. Understand Kinetics of Organic Reactions. CO4. Understand Kinetics of Organic Reactions. CO5. Understand Kinetics of Organic Reactions. CO6. Understand Kinetics of Organic Reactions. CO7. Understand Kinetics of Organic Reactions. CO8. Understand Kinetics of Organic Reactions. CO9. Understand Kinetics of Organic Reactions. CO10. Understand Kinetics of Organic Reactions. CO11. Understand Kinetics of Organic Reactions. CO12. Understand Kinetics of Organic Reactions. CO13. Understand Kinetics of Organic Reactions. CO14. Understand Kinetics of Organic Reactions. CO15. Understand Kinetics of Organic Reactions. CO16. Understand Kinetics of Organic Reactions. CO17. Understand Kinetics of Organic Reactions. CO18. Understand Kinetics of Organic Reactions. CO19. Understand Kinetics of Organic Reactions. CO20. Understand Kinetics of Organic Reactions.
17	MSc IV SEM	BIOINORGANIC CHEMISTRY & SUPRAMOLECULAR CHEMISTRY (Optional for group-A, Inorganic Chemistry)	CO1. Understand Kinetics of Organic Reactions. CO2. Understand Kinetics of Organic Reactions. CO3. Understand Kinetics of Organic Reactions. CO4. Understand Kinetics of Organic Reactions. CO5. Understand Kinetics of Organic Reactions. CO6. Understand Kinetics of Organic Reactions. CO7. Understand Kinetics of Organic Reactions. CO8. Understand Kinetics of Organic Reactions. CO9. Understand Kinetics of Organic Reactions. CO10. Understand Kinetics of Organic Reactions. CO11. Understand Kinetics of Organic Reactions. CO12. Understand Kinetics of Organic Reactions. CO13. Understand Kinetics of Organic Reactions. CO14. Understand Kinetics of Organic Reactions. CO15. Understand Kinetics of Organic Reactions. CO16. Understand Kinetics of Organic Reactions. CO17. Understand Kinetics of Organic Reactions. CO18. Understand Kinetics of Organic Reactions. CO19. Understand Kinetics of Organic Reactions. CO20. Understand Kinetics of Organic Reactions.
18	MSc IV SEM	ANALYTICAL CHEMISTRY (Optional for group-A, Inorganic Chemistry)	CO1. Understand Kinetics of Organic Reactions. CO2. Understand Kinetics of Organic Reactions. CO3. Understand Kinetics of Organic Reactions. CO4. Understand Kinetics of Organic Reactions. CO5. Understand Kinetics of Organic Reactions. CO6. Understand Kinetics of Organic Reactions. CO7. Understand Kinetics of Organic Reactions. CO8. Understand Kinetics of Organic Reactions. CO9. Understand Kinetics of Organic Reactions. CO10. Understand Kinetics of Organic Reactions. CO11. Understand Kinetics of Organic Reactions. CO12. Understand Kinetics of Organic Reactions. CO13. Understand Kinetics of Organic Reactions. CO14. Understand Kinetics of Organic Reactions. CO15. Understand Kinetics of Organic Reactions. CO16. Understand Kinetics of Organic Reactions. CO17. Understand Kinetics of Organic Reactions. CO18. Understand Kinetics of Organic Reactions. CO19. Understand Kinetics of Organic Reactions. CO20. Understand Kinetics of Organic Reactions.
19	MSc IV SEM	Laboratory Course-SPECIAL CHEMISTRY & PHOTO INORGANIC & ORGANIC-TRANSITION CHEMISTRY	CO1. Preparation of selected inorganic compounds and their study by IR, electronic spectra, Mass Spectrometry, ESR, and magnetic susceptibility measurements. Handling of air and moisture sensitive compounds involving vacuum techniques. CO2. Kinetics and mechanism of following reactions: i) Substitution reactions in substituted complex metal hydrolysis and base hydrolysis ii. Racemization in substituted ii. Inversion reaction of substituted. CO3. Estimation of chlorophyll from green leaves of spinach's leaves. Separation of chlorophylls and their stoichiometric spectral study. CO4. Coprecipitation study of Cu (II) ion with biologically important anions. CO5. Synthesis of potassium ferrioxalate and determination of the quantity of oxalate in Photooxidation of oxalate by H ₂ O ₂ sensitization. iii. Photooxidation of H ₂ O ₂ and Determination of its quantum yield.

SN	CLASS	PAPER	COURSE OUTCOME
1	BSc I	INORGANIC CHEMISTRY	CO1. Know elements. CO2. Know molecules. CO3. Understand Programs for extraction. CO4. Carry table and fill. CO5. Carry table and fill inorganic of
2	BSc I	ORGANIC CHEMISTRY	CO1. Know mechanism. CO2. Know CO3. Carry table and fill inorganic of
3	BSc I	PHYSICAL CHEMISTRY	CO1. Know elements and molecules. CO2. Carry their effect. CO3. Understand and mix side. CO4. Understand crystals. Cal. CO5. Understand reactions an industrial ap
4	BSc I	Practical work	CO1. Analytically study. CO2. Carry CO3. Define organic chem. CO4. Molar CO5. Crystal CO6. Solubility CO7. Detect detection of CO8. To do write card CO9. To do write card CO10. To do write card
5	BSc II	INORGANIC CHEMISTRY	CO1. Understand actives element. CO2. Understand compounds. CO3. Understand CO5. Understand CO2. Understand
6	BSc II	ORGANIC CHEMISTRY	CO1. Understand CO2. Understand



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DISTT. JANJGIR-CHAMPA (C.G.), Web site- www.gdiscakaltara.in/ Email ID- gdiscakaltara@gmail.com /Phone- 07817-252540

DEPARTMENT OF BOTANY (MSc)

11	MSU I SEM	2nd: Biology and Diversity of Algae, Bryophytes and Pteridophytes	<ul style="list-style-type: none"> Acquire the knowledge of history and development of Phycology and Bryology Learn about the occurrence, distribution, structure and life history of lower plants. Gain advance knowledge of evolutionary concepts in Algae, Bryophytes and Pteridophytes. Acquire knowledge of life cycle patterns and ecological importance of Algae, Bryophytes and Pteridophytes. Acquire fundamental concepts as well as recent developments of cell structure and ultrastructure of organisms. Acquire the knowledge about mechanism of translation, DNA replication, RNA damage and repair, splicing of ribozyme. Understand about cytoskeleton, flagellar and other movement. Get knowledge about respiration and photosynthesis.
12	MSU I SEM	3rd: Cell and Molecular Biology of Plants	<ul style="list-style-type: none"> Prepare the historical modern concept Understand classical and modern system of classification Acquire knowledge on molecular tools for classification. Impart knowledge on taxonomic evidence.
13	MSU I SEM	4th: Taxonomy of Angiosperm	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
14	MSU I SEM	Lab-1: Based on Paper I&II	<ul style="list-style-type: none"> Identify cyanobacteria and algae. Prepare and identify the fungal culture. Know the symptoms of disease organisms. Identify Bryophytes and Pteridophytes.
15	MSU I SEM	Lab-2: Based on Paper III&IV	<ul style="list-style-type: none"> Know the technique of isolation of DNA, preparation of RFLP. Study of different stages of mitosis. Obtain skill to identify the steps according to the rules. Know the technique of preparation of technical sheets. Know about sterility coefficient and generation of chiasmata. Know the economic importance of plants. To gain knowledge about DNA packaging To understand about structural and numerical karyotype in chromosomes. To know about mapping, genetic recombination in algae and bacteria. To gain knowledge about gene structure. Understand about mutation, transposable elements, introgression. To understand about cytogenetics of aneuploidy and polyploidy, C value variation, alien gene transfer.
16	MSU II SEM	1st: Ecology, Genetics and Cytogenetics	<ul style="list-style-type: none"> Identify cytochrome and algae. Prepare and identify the fungal culture. Know the symptoms of disease organisms. Identify Bryophytes and Pteridophytes.
17	MSU II SEM	2nd: Biology and Diversity of Gymnosperms	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
18	MSU II SEM	3rd: Plant Physiology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
19	MSU II SEM	4th: Plant Biochemistry and Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
20	MSU II SEM	5th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
21	MSU II SEM	6th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
22	MSU II SEM	7th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
23	MSU II SEM	8th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
24	MSU II SEM	9th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
25	MSU II SEM	10th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
26	MSU II SEM	11th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
27	MSU II SEM	12th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
28	MSU II SEM	13th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
29	MSU II SEM	14th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
30	MSU II SEM	15th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
31	MSU II SEM	16th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
32	MSU II SEM	17th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
33	MSU II SEM	18th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
34	MSU II SEM	19th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
35	MSU II SEM	20th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
36	MSU II SEM	21st: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
37	MSU II SEM	22nd: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
38	MSU II SEM	23rd: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
39	MSU II SEM	24th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
40	MSU II SEM	25th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
41	MSU II SEM	26th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
42	MSU II SEM	27th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
43	MSU II SEM	28th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
44	MSU II SEM	29th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity
45	MSU II SEM	30th: Plant Biotechnology	<ul style="list-style-type: none"> Acquire knowledge about Plant conservation, sustainable utilization of bioresource and awareness towards. Know about evolution, hot spots and local plant diversity



GPS Map Camera



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DEPARTMENT OF PHYSICS (MSc)

SN	NAME OF COURSE	YEAR/SE MESTER	NAME OF SUBJECT/PAPER	COURSE OUTCOME
1	MSc.	I Sem.	Paper-1 Mathematical Method -1	<ol style="list-style-type: none"> To understand the vector spaces and matrices. To obtain the series solution by Legendre and Laguerre polynomials. Study the generating function for Bessels and Hermite polynomials. To obtain the solution of integral transform and Fourier series.
2	MSc.	I Sem.	Paper-2 Classical Mechanics	<ol style="list-style-type: none"> Understand mechanics of system of particles. Understand the concept of D'Alembert principle. Solve Lagrangian and Hamiltonian formulation. Learn Canonical transformation and Poisson's Bracket.
3	MSc.	I Sem.	Paper-3 Numerical Method and C-Programming	<ol style="list-style-type: none"> Identify methods to solve numerical algebraic and transcendental equations. Computes solutions to simultaneous linear algebraic equation. Understand the concepts of finite differences. Gain knowledge about interpolation for equal intervals and unequal intervals. Understand the computer fundamentals and the C-programing language concepts. Study the concept of C-character set, identifiers and key words, variable names. Choose the Loops and decision making statements to solve the problems. Use function to solve given problem.
4	MSc.	I Sem.	Paper-4 Electronics-1	<ol style="list-style-type: none"> Know the special purpose of diode like MIS, MOS, CCD. To study the microwave devices. To understand the FET, JFET, MOSFET. To understand the process of modulation and demodulation.
5	MSc.	II Sem.	Paper-1 Mathematical Method-2	<ol style="list-style-type: none"> Understand the tensor and their transformation law. Solve the problem using Green's function and boundary value problem. Understand the Cauchy integral problem and their evaluation.
6	MSc.	II Sem.	Paper-2 Quantum Mechanics-1	<ol style="list-style-type: none"> Understand the behavior of quantum particle through Schrodinger equation and their applications. Understand the uncertainty relation and learn the matrix representation of an operator. Know the motion in central force problem. Study the time independent perturbation theory and its application such as Zeeman effect and Stark effect.
7	MSc.	II Sem.	Paper-3 Electrodynamics	<ol style="list-style-type: none"> Derive Maxwell equation and wave equation. Study the Fresnel equation and propagation of EM through different media. Study the special theory of relativity and Lorentz transformation. Get extended knowledge of electromagnetic scalar and vector potential.
8	MSc.	II Sem.	Paper-4 Electronics-2	<ol style="list-style-type: none"> Know the principles of LDR and LED. Know the purpose of photo detector and

9	MSc.	III Sem.	Paper-1 Quantum Mechanics-2	<ol style="list-style-type: none"> bipolar transistor. Study the OP-AMP and their types. Study the multivibrator. To study the application of time dependent perturbation theory. To understand the WKB approximation. Know the application and validity of Born approximation. To study the symmetry in quantum mechanics.
10	MSc.	III Sem.	Paper-2 Statistical Mechanics	<ol style="list-style-type: none"> To learn postulates of statistical mechanics. Understand statistical interpretation of thermodynamics, micro canonical, canonical and grand canonical ensembles. To study the methods of statistical mechanics used to develop the statistics for Bose-Einstein and Fermi-Dirac statistics. To understand cluster expansion and thermodynamic fluctuation.
11	MSc.	III Sem.	Paper-3 Condensed Matter Physics-1	<ol style="list-style-type: none"> Study the crystalline and amorphous solids. Understanding the concept of defects or imperfection in crystal. Study the band theory and Hall effect. Get knowledge of Weiss theory of ferromagnetism.
12	MSc.	III Sem.	Paper-4 Electronics-3	<ol style="list-style-type: none"> Understand different number system, codes, logic gates, Boolean laws and theorems. Simplify the Boolean functions to the minimum number of literals using Karnaugh map. Gain knowledge about combinational circuits and sequential circuits. Can design various synchronous and asynchronous circuits using flip flop. Design counters, shift registers using J-KD flip flop. Understand the A to D and D to A converter.
13	MSc.	IV Sem.	Paper-1 Condensed Matter Physics-2	<ol style="list-style-type: none"> Study the superconductivity. Understand the polarizations. Study the semiconductor and its types. Understand the nano-structure and their classification.
14	MSc.	IV Sem.	Paper-2 Nuclear Physics	<ol style="list-style-type: none"> Know the properties of nucleus like binding energy, magnetic dipole moment and electrical quadrupole moment. To study achievements of nuclear models of physics and its limitations. To give an extended knowledge about nuclear reactions such as nuclear fission and fusion. To understand the basic concepts of particle physics.
15	MSc.	IV Sem.	Paper-3 Atomic and Molecular Physics	<ol style="list-style-type: none"> Know the spectra of hydrogen, helium, alkali atoms. Understand the complete description of continuous X-ray spectra. Study the types of molecule. Study the diatomic molecule and principle of Frank Condon.
16	MSc.	IV Sem.	Paper-4 Electronics-4	<ol style="list-style-type: none"> Explain microcontroller architecture. Write simple programs for addition, subtraction, multiplication and division. Comprehend a suitable input and output peripheral. Study three optical fibres.



 **GPS Map Camera**



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DEPARTMENT OF ECONOMICS

PROGRAMME OUTCOMES, PROGRAMME SPECIFIC OUTCOMES AND COURSE OUTCOMES

DEPARTMENT OF ECONOMICS
 PROGRAM - BA, ECONOMICS

PROGRAM OUTCOMES

- To provide students a well-founded education in economics.
- To provide structured curricula which support the academic development of students.
- To provide and adapt curricula that prepares our graduates for employment and further study as economists.
- To provides the students with the opportunity to pursue courses that emphasize quantitative and theoretical aspects of economics.
- To provide students with the opportunity to focus on applied and policy issues in economics.

PROGRAM SPECIFIC OUTCOMES

- To provide programs that allow the students to choose from a wide range of economic specialization.
- To provide a well-resourced learning environment for economics.
- Understand the qualitative and quantitative models within the social sciences, especially economics.
- Learn to apply the methods and theories of social science to contemporary issues.
- Critically read popular and periodical literature from a social science perspective.

PROGRAM-MA, ECONOMICS

PROGRAMME OUTCOMES

- PO1- To impart knowledge about Economics, Particularly the basic concepts principles and to apply such knowledge to political economic and social context.
 PO2- To enable the students exhibiting their ability to developed economy of central and state govt.
 PO3- To develop in students to analyze Economic Problem.
 PO4- To enable the students to have an opportunity to serving as a Economist, Account Officer, statistical officer, Bank officer, Professor.
 PO5- To inculcate in student a sense of ethics and responsibility.

PROGRAMME SPECIFIC OUTCOMES

- The M.A. Economics Program is a four semester (2 Yrs) Integrated Program where students are taught both Economics courses as well as Environmental Courses after completion the student would be able to -
 PSO-1. Critically examine the Economical knowledge in relation to social, political, historical, environmental and scientific context and present critical approach using a wide range of sources.
 PSO-2. Critically assess the proposal for Economic reforms and compare it with present situation.
 PSO-3. Serve as a professor, bank officer, statistical officer, economist.
 PSO-4. Apply the Economical bases towards finding a economical solution to complex social and environmental issues.
 PSO-5. Have a basis for advance study.
 PSO-6. Have a basis for competitive exam.

COURSE OUTCOMES

S. No.	Name of Course	Year/ Semester	Name of Subject/Paper	Course Outcome
1	B.A.I	Year I	Micro Economics	It enables the students to have knowledge of Nature

S. No.	Course	Year/ Semester	Name of Subject/Paper	Course Outcome
2	B.A.I	Paper II	Indian Economy	Economic Unity, Industrial Crisis, Law of Demand, Elasticity of Demand, Income curve, cost, Market, Surplus, etc. This helps to know the Market Economy, Indian Economy.
3	B.A.II	Paper I	Micro Economics	Industrial Economics, Planning, Agriculture, Industry, Transport, Foreign trade, Role of Government, Unemployment, Price Rise, etc. It helps to understand the National Economy, Revenue theory, etc.
4	B.A.II	Paper II	Money Banking and Public Finance	Monetary Unit, Foreign Trade It enables the students to have knowledge of Money, Banking, Finance, Public Finance, etc.
5	B.A.III	Paper I	Development and Environmental Economics	It helps to understand the National Economy, Revenue theory, etc.
6	B.A.III	Paper II	Statistical Methods	It helps to understand the National Economy, Revenue theory, etc.
7	M.A.Scem-I	Paper I	Micro Economic Analysis	It enables the students to have the knowledge of basic of - Linear Programming, concept of game, Coefficient of Skewness - Karl Pearson's and Bowley's, Karl Pearson's Coefficient of correlation, Spearman's coefficient of correlation, Regression Analysis, Joint Probability and Contingency, Fisher's Ideal Index, Number etc.
8	M.A.Scem-I	Paper II	Quantitative Methods	It helps the student to have the knowledge of basic of - Linear Programming, concept of game, Coefficient of Skewness - Karl Pearson's and Bowley's, Karl Pearson's Coefficient of correlation, Spearman's coefficient of correlation, Regression Analysis, Joint Probability and Contingency, Fisher's Ideal Index, Number etc.
9	M.A.Scem-I	Paper III	Indian Economic Policy	It helps to understand the National Economy, Revenue theory, etc.
10	M.A.Scem-I	Paper IV	International Trade & Finance	It helps to understand the International Trade, Heckscher-Ohlin Theory of International Trade, The theory of trade, tariff, quotas, dumping, balance of payment, etc.
11	M.A.Scem-II	Paper V (Optional GR-0)	Labour Economics	It gives the knowledge about labour market, industrialization, methods of recruitment, employment services organizations in India, Employment and development relationship, Poverty and unemployment wage determination, etc.
12	M.A.Scem-II	Paper I	Micro Economic Analysis	It provides the knowledge about price and output determination perfect competition, monopoly, oligopoly, etc.
13	M.A.Scem-II	Paper II	Research Methodology and Computer Application	It extends the knowledge of Association of Attributes, Research methodology, sampling, classification, tabulation, hypothesis, computer, etc.
14	M.A.Scem-II	Paper III	Indian Economic Policy	It gives the knowledge about industrial sector, fiscal policies, monetary policy of RBI, export import policy, balanced regional development, WTO and its impact on different sectors of economy, etc. to prepare a budget of central and state govt.
15	M.A.Scem-II	Paper IV	International Trade & Finance	It enables students to know the concept of Exchange rate, WTO, UNCTAD, IMF, SAARC, Post War investment and international trade, Export promotion, international debt, etc.
16	M.A.Scem-III	Paper V (Optional)	Labour Economics	It enables the student to have basic knowledge of Wage Determination, Industrial Relations, Industrial

S. No.	Course	Year/ Semester	Name of Subject/Paper	Course Outcome
17	M.A.Scem-III	Paper I	Micro Economic Analysis	It enables the student to have the knowledge of basic of - Linear Programming, concept of game, Coefficient of Skewness - Karl Pearson's and Bowley's, Karl Pearson's Coefficient of correlation, Spearman's coefficient of correlation, Regression Analysis, Joint Probability and Contingency, Fisher's Ideal Index, Number etc.
18	M.A.Scem-III	Paper II	Public Economics	It helps to understand the National Economy, Revenue theory, etc.
19	M.A.Scem-III	Paper III	Environmental and Welfare Economics	It helps to understand the National Economy, Revenue theory, etc.
20	M.A.Scem-III	Paper IV	Development and Environmental Economics	It helps to understand the National Economy, Revenue theory, etc.
21	M.A.Scem-III	Paper V (Optional GR-C)	Demography	It gives the knowledge about the population, birth rate, death rate, natural mortality rate, life expectancy, migration and urbanization growth of population in India, Population explosion in India, Population policy in India, Demographic characteristics of developing countries, women empowerment, Family planning strategies, etc.
22	M.A.Scem-IV	Paper I	Micro Economic Analysis	It enables the student to have the knowledge of basic of - Linear Programming, concept of game, Coefficient of Skewness - Karl Pearson's and Bowley's, Karl Pearson's Coefficient of correlation, Spearman's coefficient of correlation, Regression Analysis, Joint Probability and Contingency, Fisher's Ideal Index, Number etc.
23	M.A.Scem-IV	Paper II	Public Economics	It helps to understand the National Economy, Revenue theory, etc.
24	M.A.Scem-IV	Paper III	Economic Development and Planning	It enables the students to have knowledge of Economic planning, indicators of India's growth, Approaches to development - various models of growth, His post history, Theory of optimal economic growth, Industrial and structural growth, Government criteria, Social and economic policy, Human capital formation, poverty, Income inequality, Unemployment, The choice of technology, economic development problems of poor etc.
25	M.A.Scem-IV	Paper IV	Economics of Social Sector	It gives the knowledge about coverage of policies, for PDS, control, water pollution control environmental protection, Environment and sustainable development, global warming climate change, green house effect, system use of resources, Social forestry, extension of education, Right to education and health economics, etc., etc., etc.
26	M.A.Scem-IV	Paper V (Optional GR-C)	Demography	It gives the knowledge about life expectancy, crude death rate, natural mortality rate, life expectancy, migration and urbanization growth of population in India, Population explosion in India, Population policy in India, Demographic characteristics of developing countries, women empowerment, Family planning strategies, etc.



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