

Shri Bhavani Shikshan Prasarak Mandal, Osmanabad
Shikshan Maharshi Gurusvarya R. G. Shinde Mahavidyalaya, Paranda

Course Outcomes for B. Sc. Mathematics

B. Sc. I

MAT 101 Differential Calculus

1. Understand the geometrical interpretation of derivative of a function,
2. Find the derivatives of hyperbolic functions and implicit functions,
3. Find the n^{th} derivative of standard functions and solve problems on the same,
4. Find the value of n^{th} derivative at a particular point,
5. State and prove mean value theorems,
6. Apply mean value theorems to find nature of graphs of the functions and approximate values,
7. Understand the partial differentiation and its rules,
8. Understand and solve problems on Euler's theorem on homogeneous functions,
9. Find and apply the directional derivatives of scalar and vector point functions,
10. Solve problems on divergence, curl and gradient.

MAT 102 Differential Equations

1. Find the order and degree of a differential equation and recognize the difference between general, particular and singular solutions,
2. Identify the exact differential equation,
3. Apply various methods to solve a linear differential equations with constant coefficients,
4. Reduce the linear differential equations with variable coefficients to linear differential equations with constant coefficients and solve it,
5. Solve exact differential equation of order n ,
6. Solve system of simultaneous ordinary differential equations,
7. Define a partial differential equation,
8. Eliminate arbitrary constants and arbitrary functions to obtain a partial differential equation.

MAT 201 Integral Calculus

1. Understand the meaning of integration as a limit of a sum,
2. Derive reduction formulae and use them to solve particular integrals,
3. Integrate the rational functions,
4. Integrate trigonometric functions with integer power,
5. Apply integration to find area of a random region (formed by a curve and tow coordinate axes),



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6. Apply integration to find the length of a curve between two points.

MAT 202 Geometry

1. Recognize and find the equation of a plane satisfying given conditions,
2. Find the equation of the plane in a given system,
3. Find the distances between two geometric objects like a point and a plane, a line and a plane etc.,
4. Find the angle between two lines and two planes,
5. Find the equation of a straight line satisfying the given conditions,
6. Understand the co-planarity of two lines,
7. Recognize the various forms of equation of a sphere and find the equation of a sphere under given conditions and calculate its centre and radius,
8. Differentiate between the central conicoids and find their equations under given conditions,
9. Check the condition tangency of a plane to sphere, cone, cylinder and conicoid, find the equation of the tangent plane and find the point of contact.

B. Sc. II

MAT 301 Number Theory

1. Solve numerical using division algorithm,
2. Find the greatest common divisor of sufficiently large numbers using Euclidean algorithm,
3. Recognize a solvability and obtain all the solutions of a Diophantine equation,
4. State and prove the fundamental theorem of arithmetic,
5. Understand the use of congruence theory and solve problems on Chinese remainder theorem,
6. Find the values of number theoretic functions
7. Understand the properties of the number theoretic functions,
8. Understand the relations among the number theoretic functions.

MAT 302 Integral Transforms

1. Define Beta and Gamma functions and represent them in different forms,
2. Apply properties of Laplace transforms to evaluate Laplace transforms of standard functions,
3. Apply properties of inverse Laplace transforms to evaluate inverse Laplace transform of standard functions,
4. Apply Laplace transforms and inverse Laplace transforms to solve linear ordinary differential equations,
5. Define Fourier transforms and find Fourier transforms of standard functions.

MAT 303 Mechanics I

1. Find the resultant of any number of forces acting on a particle,
2. Find the resolved parts of forces acting on a particle and solve numerical on the same,
3. State the condition of equilibrium of two forces acting on a particle,
4. State the necessary and sufficient condition for any number of forces to in equilibrium,
5. Define the moment of force and find the same for parallel forces and couples,
6. Solve the problems on moment of force,
7. Define and find the centre of gravity of some uniform bodies,
8. Solve simple problems on centre of gravity.

MAT 401 Numerical Methods

1. Obtain the approximate solution of a linear and transcendental equation up to a desired accuracy,
2. Understand the differences and apply interpolation formulae to solve problems,
3. Apply approximate linear or non-linear function that fits a given data,
4. Apply numerical methods of linear algebra in real life problems,
5. Obtain an approximate solution to differential equations whose analytic solution is not known.

MAT 402 Partial Differential Equations

1. Define partial differential equation and know the difference between ordinary and partial differential equations,
2. Solve Lagrange's differential equation,
3. Understand complete and particular integrals, and use Charpit's method to solve a non linear partial differential equation,
4. Solve linear partial differential equations of order one with constant coefficients,
5. Solve linear partial differential equations of order two by Monge's method and transformations method.

MAT 403 Mechanics II

1. Understand the difference between kinematics and kinetics of a particle. Find the Cartesian components, tangential and normal components and radial and transverse components of velocity and acceleration,
2. Understand the laws of conservation of momentum and energy, work done in conservation and non conservative field of force,
3. To apply the knowledge of motion in non-resisting and resisting medium of projectile in practical situations,
4. To find the maximum range, time of flight and maximum height attained by a projectile,
5. Understand the equation of central orbit and pedal equations of standard curves.

B. Sc. III

MAT 501 Real Analysis I

1. Understand the basic notion sets and its elements and able to decide whether an element is in a given set or not, also find the least upper bound for a given set, if it exists,
2. Perform various operations on sets,
3. Define real valued functions, one to one correspondence between two sets,
4. Recognize convergence and divergence of a sequence and compute the limit of convergent sequence,
5. Explain properties of monotone sequences, bounded sequences and results on these sequences,
6. Define and understand Cauchy criterion,
7. Define and compute convergence and divergence of series of real numbers,
8. Apply tests for absolute convergence on a given series,
9. Compute Jacobian of given functions using the properties of Jacobians,
10. State and prove the necessary and sufficient condition to vanish,
11. Understand the functional dependence and find the relation among the dependent functions.

MAT 502 Abstract Algebra I

1. Define sets, mappings and integers and understand the properties of them,
2. Define groups and provide examples of the groups,
3. State and prove some standard results derived from the definition of group,
4. Define subgroups and understand the criteria to be satisfied by the subgroups,
5. Define normal subgroups and quotient groups and demonstrate their properties,
6. Prove that a given mapping between two groups is homomorphism and automorphism,
7. Define rings and derive its elementary properties,
8. Derive results on ideals, quotient rings.

MAT 504 Ordinary Differential Equations I

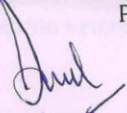
1. Define complex numbers and understand its algebra and geometric representation,
2. Define functions, polynomials, complex series, exponential functions and determinants and state their properties,
3. State and prove existence and uniqueness theorem for the solution of first order homogeneous and non homogeneous differential equation,
4. Define linear differential equation of higher order,
5. State and prove existence and uniqueness of solution of second order linear differential equation with constant coefficients,
6. Define initial value problem for second order linear differential equation,

Course outcomes

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7. Define linear dependence and independence of functions and verify the same using Wronskian.

MAT 601 Real Analysis II


1. Understand the concept of distance between two abstract notions like distance between two sequences, prove a given space is metric space, extend the continuity of a function to a general metric space, formulate continuity in terms of open and closed sets,
2. Understand and recognize the connectedness, completeness and compactness of a given metric space, check the continuity on these metric spaces,
3. Understand the concept of Riemann integration, recognize the Riemann integrable functions and evaluate the integration of such functions, prove the fundamental theorems of integral calculus,
4. Define which functions may be expanded as Fourier series and find the Fourier series of the such functions, deduce the convergence of some important series using Fourier series.

MAT 602 Abstract Algebra II


1. Define vector space and subspace and produce examples of it,
2. Derive elementary results and theorems using definitive axioms,
3. Define homomorphism and prove or disprove given mapping is homomorphism,
4. Explain linear dependence and independence, linear span and basis,
5. Understand and find the dimension of a vector space and prove results on finite dimensional vector spaces,
6. Define dual spaces and solve problems on the same,
7. Define inner product spaces and give some of its examples,
8. Define orthonormal sets and explain Gram Schmidt orthogonalization process.

MAT 604 Ordinary Differential Equations II

1. Define initial value problem and its solution,
2. Define Wronskian and prove linear dependence of functions,
3. Reduce the order of a linear differential equation,
4. Solve the initial value problem,
5. Solve the Legendre's equation,
6. Define singularity and singular points,
7. Recognize and solve Euler's and Bessel equations.



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(COURSE OUTCOME)

Sr. No.	Class	Paper	Outcome
1	B. Sc. I	Paper I Mechanics, Properties of Matter and Sound	This course would empower the student to acquire engineering skills and practical knowledge, which help the students in their everyday life. The properties of solids especially knowledge of elasticity help the students to identify the materials suitable for the construction of buildings, houses etc. Properties of fluids especially knowledge of viscosity and surface tension help the students in their daily life and agriculture. This syllabus will cater the basic requirements for their higher studies. This course will provide a theoretical basis for doing experiments in related areas.
2		Paper II Heat and Thermodynamics	This course is intended to give an insight to heat and thermodynamics. Students will familiarise with processes in thermodynamics which are the back bone of heat engine, which will be useful for research and job.
3		Paper IV Geometrical and Physical Optics	This course aims to provide necessary foundation in optics and photonics which prepare the students for an intensive study of advanced topics at a later stage. Covering the very important and fascinating areas of interference diffraction and polarization with many experiments associated with it.
4		Paper V Electricity and Magnetism	Electricity and Electrodynamics have the key role in the development of modern technological world. Without electric power and communication facilities, life on earth stands still. A course in electricity and electrodynamics is thus an essential component of physics programme at graduate level. This course is expected to provide a sound foundation in Electricity and Electrodynamics. Students should familiarise with electrical circuits, electrical connections, and storage devices their working etc. which will be quite useful in their daily life. Theoretical and practical knowledge about signal generating circuits enable the students to identify different communication techniques which will be useful in their daily life and higher studies



5	B. Sc. II	Paper VII Mathematical , Statistical Physics and Relativity	Students who have completed this paper should be familiar with the main mathematical methods used in physics. Students who have completed this paper should have a deep understanding of physical statistics and its relation to information theory.
6		Paper VIII Modern and Nuclear Physics	Develop the concepts of modern physics: basic knowledge of special theory of relativity and general theory of relativity, elementary quantum mechanics, nuclear physics, and particle physics. Understand the relationship between observation and theory and their use in building the basic concepts of modern physics Acquire knowledge in the content areas of nuclear and particle physics, focusing on concepts that are commonly used in this area. Develop familiarity with the vast areas of nuclear and particle physics as well as develop an interest in these subjects.
7		Paper XI General Electronics	Students who have completed this paper should have a deep understanding of basic knowledge of semiconductor physics. Understand basic digital electronic systems. Be learning function of basic transistors biasing and amplifiers.
8		Paper XII Solid State Physics	This course is intended to provide an introduction to the physics of Condensed Matter. Material science is a very wide branch where extensive research is going on. Thermal, electrical, optical and magnetic properties of matter provide a strong foundation in that direction
9	B. Sc. III	Paper XV Classical & Quantum Mechanics	This course is a prelude to advanced theoretical studies in Condensed Matter Physics, Spectroscopy, Astrophysics Electrodynamics and nuclear physics. It is conceptually rich and technically difficult. Special techniques are developed for attacking more realistic problems.
10		Paper XVI Electrodynamics	Students who have completed this paper should have a deep understanding of the theoretical foundations of electromagnetic phenomena, Be able to solve the Maxwell equations for simple configurations, Have a working knowledge of special relativity.
11		Paper XIX Atomic, Molecular Physics & Laser	The study of atomic physics has led to many present day technological wonders such as lasers and medical imaging. The second part of this course will describe the structure of atoms, and the interactions between atoms, as well as the effects of electric and magnetic fields on atomic and molecular structure, leading to a discussion of modern laser based spectroscopy.



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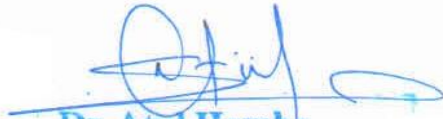
Course outcome in Zoology 2018-19

Zoology

<i>Paper No.</i>	<i>Course Outcomes (Cos)</i>
Protozoa to Annelida	<ul style="list-style-type: none"> ➤ Came to knowing the basic concept of biosystematics and procedure in taxonomy. ➤ Identified the taxonomic status of the entire non-chordates up to annelids and discuss the evolutionary model of the group. ➤ Described the general biology of few selected non-chordates useful to mankind. ➤ Know about some of the important and common protozoans, helminths of parasitic nature causing diseases in human beings.
Arthropoda to Protochordata	<ul style="list-style-type: none"> ➤ Understood the importance of metamerism in annelids. ➤ Understood the diversity and classification and functional aspects of different systems of phylum Arthropoda, Mollusca and Echinodermata. ➤ Described the social life and economic importance of insects. ➤ Described the advanced characteristic features of cephalopod molluscs. ➤ Came to know that the resemblance and evolutionary significance of larval forms of echinoderms.
Cell biology	<ul style="list-style-type: none"> ➤ Understood the structure of cells and cell organelles in relation to the functional aspects and understanding of the working principles and applications of microscopes ➤ Described the composition of prokaryotic and eukaryotic cells. ➤ Understood the structure and functions of chromosome; mitotic and meiotic cell divisions and their significance ➤ Understood the properties and treatment of cancer cells. ➤ Acquired knowledge of principles and working mechanisms of microscopes ➤ Understood the mechanism of mitosis and meiosis.
Genetics I	<ul style="list-style-type: none"> ➤ Understood the theories of classical genetics and blood group inheritance in man ➤ Described the genetic variation through linkage and crossing over, chromosomal aberrations and sex determination. ➤ Understood the genetic defects and inborn errors of metabolism and genetic counselling and role of inbreeding and outbreeding. ➤ Understood the molecular structure of genetic materials and understood the mechanism of gene expression and regulation character formation.
Vertebrate zoology	<ul style="list-style-type: none"> ➤ Identified the taxonomic status of the entire chordates and discussed the evolutionary model of the group. ➤ Imparted the knowledge on ecology of some important fishes, amphibians reptiles, birds and mammals. ➤ Impart knowledge in comparative anatomy and development systems of

	<p>chordates.</p> <ul style="list-style-type: none"> ➤ Make able to discuss some and very important phenomena in Chordates. ➤ Know about the conservation and management strategies of the chordate fauna.
Animal physiology	<ul style="list-style-type: none"> ➤ Students gain fundamental knowledge of animal physiology ➤ Students will gain skill to execute the roles of a biology teacher or medical lab technicians with training as they have basic fundamentals ➤ Students are taught the detailed concepts of digestion respiration excretion the functioning of nerves and muscles ➤ Understood about the composition of food and mechanism of digestion absorption and assimilation. ➤ Attained knowledge of respiration and excretion and understood the mechanism of transport of gases and urine formation. ➤ Described the mechanism of circulation and composition of blood ➤ Knowledge of neuromuscular coordination and the mechanism of osmoregulation in animals and endocrine system and their function is attained. ➤ Understood the menstrual cycle and the role of contraceptive in population control.
Genetics II	<ul style="list-style-type: none"> ➤ To study the structure of nucleic acids ➤ To understand the gene expression and regulation in Prokaryotes & Eukaryotes. ➤ To gain better knowledge in both Prokaryotes & Eukaryotes about the Gene Mutation, Repair Mechanisms, Nuclear Genome Organization, Genes and gene numbers. ➤ Comprehensive and detailed analysis of fine structure of the gene. ➤ Analyze the role of transposable elements in prokaryotes and eukaryotes. ➤ Insight into the manipulation of genetic material for a wide variety of
Biochemistry & Endocrinology	<ul style="list-style-type: none"> ➤ This paper gives an idea about the glands which works inside the body and secretes a chemical called hormone. ➤ Comprehended the energy source, chemical bonds and the principles of thermodynamic ➤ understood the importance of acid base balance ➤ Attained the knowledge of macromolecule such as carbohydrates, protein and fat, their types and significance. ➤ Understood the knowledge of cholesterol and its biological significance ➤ Described the enzymes, mechanism of enzyme action and factors affecting the enzyme activity ➤ Understood the types and importance of vitamins ➤ Interactions and interdependence of physiological and biochemical processes
Ecology	<ul style="list-style-type: none"> ➤ learn basic concepts. ➤ learn Auto Ecology and Population Ecology. ➤ learn Dynamics of Population. ➤ learn Ecology of Communities. ➤ learn Functional and Structural Features of Communities. ➤ learn Ecosystem and Characteristics. ➤ learn Functional Characteristics of Ecosystems. ➤ learn Ecological Cycles, Biological Accumulation. ➤ learn The Great Ecosystems in the World. ➤ learn Evolutional Ecology, Natural Selection, Genetic Variability. ➤ learn Life Strategies, Gene Banks. ➤ learn Applied Ecology.

	<ul style="list-style-type: none"> ➤ learn Ecological Problems of Humanity, Protection of the Nature and Biological Variability.
Evolution	<ul style="list-style-type: none"> ➤ Define Geological Time Scale and describe zoogeographical Realms. ➤ Describe the barriers, dispersals and their impact on animal Distribution ➤ Describe the adaptive features of both primary and secondary aquatic vertebrates. ➤ Describe the adaptive features of desert reptile and mammals ➤ Write down the Chemical basis of origin of life and experiments for supporting that idea. ➤ Describe the Theory of Evolution considering Darwinism and Modern Synthetic Theory ➤ Describe the Isolating mechanisms, modes of speciation, Biological & Evolutionary Species
Parasitology and Helminth I	<ul style="list-style-type: none"> ➤ Describe the common parasitic diseases and life-threatening conditions caused by helminthes and protozoa as regards etiology and life cycle of parasites of medical importance ➤ Describe the common diseases caused by helminthes and protozoa as regards pathogenesis, clinical features, differential diagnosis and complications ➤ Point out the methods of recovery of parasites and their culture methods as well as immunological and molecular methods used for diagnosis of parasitic infections ➤ Define the principles of management for common parasitic diseases and life-threatening conditions ➤ Outline methods of disease prevention ➤ Recognize safety procedures relevant to parasitic diseases during practical year
Parasitology and Helminth II	<ul style="list-style-type: none"> ➤ Identify, describe and contrast unicellular parasites and parasitic worms Utilise knowledge in the application of parasite control and treatment methodologies ➤ Describe specific human and non-human parasitic diseases ➤ observe live parasitic specimens ➤ Report on observations of biological specimens such as parasites ➤ Appraise the impacts of parasitic diseases on human societies ➤ Evaluate the complexity of the parasite/host relationship (parasite evasion mechanisms vs host defensive mechanisms)
Sericulture:	<ul style="list-style-type: none"> ➤ Gives knowledge of silk worm rearing ➤ Pests and diseases associated with silk worm and mulberry ➤ Various process involved in silk production ➤ Understood the culture of mulberry plants


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(COURSE OUTCOME)

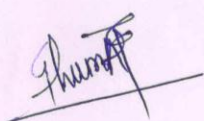
Sr. No.	Class	Paper	Outcome
1	B. Sc. I	Paper I Inorganic Chemistry	Students will able to understand <ul style="list-style-type: none">• Structure of atom, various atomic properties like ionization potential, atomic size, electron affinity, electronegativity etc.in the groups and across the periods.• 2. S-block and P-block elements in the periodic table.
2		Paper II Organic Chemistry	Students will able to understand <ul style="list-style-type: none">• General and basic ideas associated to structure, bonding, stereochemistry and reactivity of organic molecules.• Fundamental of mechanism of organic reactions.• General idea and chemical reactivity of alkane, alkenes and alkyl and aryl halides.• Aromaticity and electrophilic reactions of benzene.•
3		Paper IV Physical Chemistry	<ul style="list-style-type: none">• Student understand mathematical parameters like logarithm derivative integration probability graph representation etc.• Understanding the surface phenomenon's like Adsorption, mechanism of adsorption, factors affecting Adsorption, difference between adsorption and absorption types of adsorption is important etc.• Deduction of Gas Laws: Boyles Law, Charles Law, Grahams Law of diffusion, Avogadro's hypothesis, deviation from ideal behavior, van der Waals equation of state.• Types of catalyst and order of reaction.• Difference between solids, liquids and gases state. Classification, structure of nematic and cholestric phases.• Understanding laws of crystallography and X-ray diffraction by crystals. Derivation of Bragg equation.• Definition of colloids, classification, properties and applications of colloids.

4		Paper V Inorganic Chemistry	<p>Students will able to understand</p> <ul style="list-style-type: none"> • Chemistry of noble gases, meaning of ionic and covalent bonds, formation of covalent and ionic bonds, VSEPR theory, hydrogen bonding, MO theory • Basic concepts in nuclear chemistry and theory of volumetric analysis.
5		Paper III & VI Lab Course	<p>Annual system (practical outcomes)</p> <ul style="list-style-type: none"> • Acquaintance with glassware, handling of chemicals, safety measures, laboratory protocol. • Preparation of solution and its standardization. • Understanding of determination of equivalent weight of Mg and rate of reaction, viscosity, surface tension of liquid. Verification of Lambert-beer's law. • Estimation of organic compounds, qualitative and quantitative analysis skills. • Inorganic qualitative analysis.
6		Paper VII Organic Chemistry	<p>Students will able to understand</p> <ul style="list-style-type: none"> • Synthesis of alcohols, reactions of ethylene glycol and glycerol, preparation and electrophilic aromatic substitution reactions of phenol. • Name reactions exhibited by aldehydes and ketones with mechanism • Synthesis and chemical reactions of carboxylic acids, decarboxylation of malic, tartaric and citric acids, reactions of compounds of nitrogen.
7	B. Sc. II	Paper VIII Physical Chemistry	<ul style="list-style-type: none"> • Understanding terms: System, Surrounding types of system, intensive and extensive properties. • Thermodynamic Process, reversible and irreversible process, concept of maximum work (W_{max}). • Law of Thermodynamics: Statement, Definition of Internal energy and Enthalpy. Heat capacity, heat capacities at constant volume pressure and their relationship. • Calculation of W, q, du and dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible

		<p>process.</p> <ul style="list-style-type: none"> • Hess's law of heat Summation and its application. • Carnot Theorem. Concept of Entropy, Gibbs and Helmholtz. • Understanding the concept of Free Energy, Law of Mass Action, Le Chatelier's Principle, Clausius-Clapeyron Equation and its Application.
8	Paper X Inorganic Chemistry	<p>Students will able to understand</p> <ul style="list-style-type: none"> • Features, electronic configuration and general properties of first transition series elements like color, oxidation state etc. • Werner's co-ordination theory, nomenclature of coordinate compounds, formation of complexes based on VBT. • Chemistry of Lanthanides and actinides • Theories of acids and bases and reactions in nonaqueous solvents.
9	Paper XI Physical Chemistry	<p>Students will able to understand</p> <ul style="list-style-type: none"> • Understanding the concept Phase Rule Equation, Phase Equilibria of the one and two Component System with Example. • Raoult's Law and Henry's Law. Ideal and Non-Ideal system. Lower and Upper Consulate Temperature. • Types of Conductance, variation of equivalent and specific conductance with dilution. • Kohlrausch's law, Ostwald's Dilution Law. • Transport Number: Definition, Determination by Hittorfs Method and Moving Boundary Method. Types of Titration. • Types of Reversible Electrodes. Nernst Equation, Types of electrode, Electro-Chemical Series and its significance. • Buffer-Acidic and Basic Buffers, Mechanism of Buffer Action. Types of corrosion.
10	Paper IX &XII Lab Course	<p>Annual system (practical outcomes)</p> <ul style="list-style-type: none"> • Study the Gravimetric Estimation of Zn, Mn, Ni, Ba and Al. • Understanding the Complexometric Titration of Zn, Ni, Cu and Pb. By using indicator. • To study the instrument of Conductometer, pH-meter,

			<p>colorimeter, Polarimeter and refractive meter.</p> <ul style="list-style-type: none"> • To prepared Organic Derivatives likes Acetyl, Benzoyl, Hydrolysis, Bromo, Reduction and Osazone Derivatives. • The organic estimations of Estimation of nitro group by reduction. • Estimation of glucose. • Estimation of ester and amides by hydrolysis.
11		Paper XIII Physical Chemistry	<ul style="list-style-type: none"> • Study Black body radiation, Planck's radiation law, photoelectric effect, Compton effect. De Broglie Hypothesis. • Heisenberg's uncertainty principles, Harmiltonian operator, Schrödinger wave equation and its importance. • Understanding the concept electromagnetic radiation, regions of the spectrum, basic features of different spectrometers, statement of the born-oppenheimer approximation. Rotational Spectrum and numerical problems. • Study laws of photochemistry, Grothus - Drapper law, Stark-Einstein law, Jablonsiki diagram. • Quantum yield and its types. • Understanding the Nano-materials and synthesis methods.
12	B. Sc. III	Paper XIV Organic Chemistry	<p>Students will able to understand</p> <ul style="list-style-type: none"> • Detailed study of NMR spectroscopy, structure determination of organic compounds using NMR, IR and UV techniques. • Chemical reactions of organometallic compounds like G.R, organozinc and organolithium compounds. • Synthetic applications of active methylene groups ethyl aceto acetate and diethyl malonate. • Chemistry of fats, oils and detergents.
13		Paper XVI Inorganic Chemistry	<p>Students will able to understand</p> <ul style="list-style-type: none"> • Crystal field theory and it's basic concepts, splitting of d-orbitals in octahedral, tetrahedral and square planar complexes, factors affecting CFT. • Types of electronic transitions, selection rules for d-d transition, energy level diagrams. • Nomenclature and classification of organometallic

		<p>compounds, preparation and properties.</p> <ul style="list-style-type: none"> • Essential and trace elements in biological processes, biological role of Na⁺ and K⁺, nitrogen fixation. • Classification of chromatographic techniques, ascending, descending techniques, TLC applications.
14	Paper XVII Organic Chemistry	<p>Students will able to understand</p> <ul style="list-style-type: none"> • Synthesis of heterocyclic compounds, electrophillic and nucleophillic reactions of heterocyclic compounds. Comparison of basicity of pyridine, piperidine and pyrrole. • Introduction and classification of carbohydrates open and ring structure of glucose, mechanism of mutarotation and polysaccharides. • Classification and synthesis of synthetic polymers, properties of polymers, introduction to synthetic rubber and it's uses. • 4. Color and constitution of dyes, synthesis of dyes. Classification, synthesis of drugs. Properties of ideal drug.
15	Paper XV & XVIII Lab Course	<p>Annual system (practical outcomes)</p> <ul style="list-style-type: none"> • Semi-micro qualitative analysis, organic and inorganic quantitative analysis skills. • Separation of Ca and Ni from binary mix. and estimation of Ni gravimetrically. • Estimation of Cl in given sample of bleaching powder. • Estimation of Vit.C, ascorbic acid, carbonyl group. • Organic preparation and it's purity by TLC. • Conductometric, PH metric and potentiometric titrations. • Determination of interfacial tension , standard free energy change.



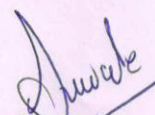
Mr. Ghumare A. B.



Mr. A.B. Gorepatil.



Mr. J.M. Mali



Principal


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Course Outcomes of all Programmes offered by Department

Name of Department: Botany

S.R No	Name of the Course	Course Code	Course Outcomes (CO)
1	I. Diversity of Cryptogams - I	B-2061	<ol style="list-style-type: none"> 1. The students will be able to understand the Structure and reproduction of certain selected algae, fungi. 2. learn about the importance of the plant diversity. 3. they Will know the economic values of this lower group of plant community.
2	II. Morphology of Angiosperms	B-2056	<ol style="list-style-type: none"> 1. The Students will understand various Angiosperm plant habits. 2. Learn about vegetative and reproductive structural features of Angiosperms. 3. Understand various modifications and its purpose in plant parts.
3	V. Diversity of Cryptogams - II		<ol style="list-style-type: none"> 1. The students will learn about the structure and reproduction of certain selected species of and bryophytes, pteridophytes and Gymnosperms 2. learn few representatives of fossil forms.
4	VI. Histology, Anatomy and Embryology	Y-2074	<ol style="list-style-type: none"> 1. The students will learn about the basic concepts in anatomy. 2. Understand the various components of stem and wood during its secondary growth. 3. be enlightened about the mechanism of pollination and basic structure of the embryo.
5	IX. Taxonomy of Angiosperms	N-2031	<ol style="list-style-type: none"> 1 Comprehend the concepts of plant taxonomy 2. Learn about various Angiosperm families and its economic value.
6	X. Plant Ecology		<ol style="list-style-type: none"> 1. The students will understand the basic concepts of general geology, ecology and phytogeography. 2. learn about the analyse and basic principles of Ecology. 3. Understand the importance of ecology and Conservation
7	XIII. Gymnosperms and Utilization of plants		<ol style="list-style-type: none"> 1. know the characters of Gymnosperms. 2. The students will understand the use of the plant resources to produce valuable products. 3. Be enlightened about the opportunities for income and employment generation. 4. be able to develop the ability to think and create useful plant products.
8	XIV. Plant Physiology		<ol style="list-style-type: none"> 1. The Students will learn about absorption, translocation and utilization of water and other minerals. 2. Comprehend the changes during growth process (germination to absCission).

			<p>3. Understand the energy flow and various metabolic cycles with their integration.</p> <p>4. Get an overall perception about various physiological processes occurring in plants.</p>
9	XVII. Cell Biology and Molecular Biology		<p>1. The students will be able to learn about the basics of cell and its inclusions.</p> <p>2. By the end of this course students will be able to understand the structure of cells in relation to the functional aspects.</p> <p>3. to understand the difference between prokaryotic and eukaryotic cells.</p> <p>4. to learn the functioning of the cell at the molecular level.</p> <p>5. to understand the properties of nucleic acids (DNA & RNA).</p>
10	XVIII (C) Plant Pathology		<p>1. Know the terminologies in plant pathology.</p> <p>2. Understand the scope and importance of Plant Pathology.</p> <p>3. Know the control measures of plant diseases.</p>
11	XXI. Genetics and Biotechnology		<p>1. Understand the basic concepts of Mendelian genetics, its variations and applications.</p> <p>2. have a basic understanding of the plant genetic transformation methods</p> <p>3. The students will understand the basic concepts of genome organization in plants.</p> <p>4. be fully aware of the basics and applications of plant biotechnology.</p>
12	XXII (C) Microbiology and Disease Management		<p>1. The students will get an understanding about the diversity of microbes.</p> <p>2. They will learn the potentialities of microbes enhancing human welfare.</p> <p>3. They will be enlightened about the role of microbes in ecological balancing of nature.</p>


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