

B.Sc.. Mathematics

Programmed Outcome

- (1) It provides a base for higher studies and refines the brain of students in comparison to other students as study of mathematics helps to increase the act of logical thinking.
- (2) Students can apply their knowledge in other branches of study as mathematics find application in every field of knowledge.
- (3) Students of science have greater chance of employment e.g. in finance and investment . teaching ,keep up mathematical knowledge in the changing environment of technology.
- (4) Study of mathematics enhances personal development. One learns to develop skills and time management.

Course Outcome

B.Sc.Part One

Calculus :

- By learning the topics taught in this paper student learns how to tackle problems of successive differentiation in other branches of science. Topics like curvature and curve tracing find applications in a number of research fields. Vector calculus too is very useful in building the concepts of Physics.
- In integral calculus student learns to find length, area, volume and surface of revolution of standard curves. A student can apply his knowledge of calculus in physics, chemistry statistics and can also create mathematical models in order to arrive into an optimal solution.
- To Identify and solve the first order and first degree linear differential equations
- To find orthogonal trajectories.
- To solve exact and differential equation of second order simultaneous equations

Algebra:

Student will be able to

- Apply De Morgan's theorem on functions properties of direct inverse and hyperbolic function.
- To find the logarithm of complex quantities.
- To expand trigonometric function.

- To solve the problem of roots and coefficient of polynomial of the variables.
- To solve the cubic equations.
- To transform different kinds of polynomials.
- To define mapping relations congruence modulo.
- To find gcd of problems based on congruence modulo.
- To define group, subgroup and properties.
- To find order and generator of group.
- To use of cosset decomposition in the langrage's theorem.
- To understand zoomorphism and isomorphism.
- To construct normal, quotient group.
- To find kernel of Homomorphism

B.Sc. PartTwo

Advanced Calculus:

- The topics taught in this paper serve as pivot for other branches of science. For example partial differentiation, Laplace's transformations are few topics in which student must have a good knowledge to understand the concepts of Physics, Chemistry etc.
- Topics taught in this paper like envelope, evolutes, Beta function, Gamma function have been introduced to handle the topics in Physics.

Differential Equation:

Students will learn

- To solve the differential equation by power series frobeniens method.
- To solve Bessel's, Legendre's equation.
- Familiar with generating function recurrence relation.
- To solve orthogonality strum- Liouville problem.
- To find Laplace transform.
- To find inverse Laplace transform.
- To apply shifting theorem to solve problems.
- To solve differential equation with the help of Laplace transform.
- To solve differential equations of first order.
- To solve equation with Lagrange's and char pits method.
- To solve D. E of second and higher orders.
- To classify D. E , reducible to equation with constant Coefficient.
- To define proximity, maximal's, externals.
- To solve boundary value problem with the help of Euler's Lagrange's equation.

- To find the externals.

B.Sc. Final

Analysis

Students will learn

- To perform basic mathematical operation on complex number
- To define continuity and differentiability..
- To define analyticity, find CR equations.
- To find harmonic function.
- To formation of analytic function with the help of Mile Thomson method.
- To identify different type of Elementary function.
- To decide when and where are given function is analytic.
- To understand the metric space properties and able to verify whether a given function is metric.
- To explain the geometric meaning of metric.
- To distinguish between open and closed balls.
- To define convergence for sequence in a m s.
- Continuity of a function between two m s.
- To understand contraction principle, dense, subsets, separable space.
- To understand FIP, continuous function, compact set.

Abstract Algebra

Students will learn

- To explain linear transformation and their representation as matrices.
- To find the rank and mobility.
- To find the basis.
- To evaluate Eigen values at Eigen vector of LT
- To formation of inner product spaces
- To distinguish the orthogonal set
- To orthogonalize the finite dimensional vector spaces..
- To precise and accurate mathematical definition of object in ring theory.
- To use definition to identify and construct examples.
- To analyze and demonstrate example of Ideas and quotient rings.
- To use rings like polynomial and modular rings.
- Use concept of homomorphism, isomorphism for rings.

- analyze finite and infinite dimensional vector space subspace over field ,including properties structures of vs.
- Compute Eigen values and eigenvectors and applied the basic diagonalization.
- Compute inner product including Graham Schmidt process.

M.Sc. Mathematics

Programme Outcome

- There is a greater chance of self employment and variety of career opportunities like analyst, teaching, banking sector etc.
- Students can pursue research in mathematics and also in interdisciplinary subjects.
- There is an opportunity to fulfill academic hunger.

M.Sc. Mathematics

Course Outcome

M Sc. I Semester

Paper I – Advanced Abstract Algebra-I

- In Abstract Algebra, a composition series provides a way to breakup and algebraic structures that is group or a module into simple pieces.
- Modules are very closely related to the Representation theory of groups and are used widely in algebraic geometry and algebraic topology.
- Field theory widely used in Algebra, number theory and many cryptographic Protocols.

Paper II – Real Analysis -I

- Riemann Stieltjes Integral serves as an instructive and useful procedure of the living integral for the students and also they used it for discrete and continuous probability.
- Power series are useful tools that can be used to expand other functions solve equation and applied in all areas of engineering.
- In the mathematical field of analysis, uniform convergence of convergence is a mode of functions stronger than point wise convergence.

Paper III – Topology -I

- This paper gives the basic idea of topology and it serves as a foundation for future for future study in Analysis, geometry, fuzzy topology, algebraic topology etc.

- Continuity of function is of core concept of topology. Topology finds applications in Physics, Economics, Networking, Computer Science and many other branches of knowledge.

Paper IV - Complex Analysis-I

After completing the course students will be able to

- Carry out computations with the complex exponential, logarithm and root functions and know their definition.
- Calculate the image of circle and lines under mobius transformation.
- Find the harmonic conjugate to harmonic function .
- Express analytical function in terms of power series and Laurent's series Taylor series.
- Calculate Complex line integrals and some infinite real integral using Cauchy's Residue theorem (contour integral).
- Find the number of zeros and poles within a given curve using argument principle, Rouché's theorem.
- Work with multivalued function.

Paper V – Advanced Discrete mathematics-I

- Boolean algebra is used to analyse and simplify the digital circuits. Boolean algebra also used to the design of switching circuits.
- Lattice theory is the use of Boolean algebra's in modelling and simplified switching circuits.
- The study of computability theory in computer science is closely related to the study of computability in mathematical logics.
- Descriptive complexity theory relates logics to computational complexity.

M Sc. II Semester

Paper-1 Advanced Abstract Algebra-II

- Noetherian and Artinian modules and rings are generalized finiteness conditions. Noetherian conditions prevents chains from piling up too much and artinian condition prevent them from infinitely shrinking.
- Smith normal form is useful in topology to compute the homology of a simplicial complex and also used in control them to compute transmission and blocking zeros of a transfer function matrix.
- In the field of abstract algebra, structure theorem for finitely generated modulus over PID is generalization of Fundamental Theorem of finitely generated abelian groups. It

provides simple framework to understand various Canonical form results for square matrices over fields.

Paper II- Real Analysis-II

- Lebesgue spaces are used in the theoretical discussion of problems in Physics ,Statistics ,Finance, Engineering and other disciplines.
- L^p space used to derived from the fact that they offer a partial but useful generalization of the fundamental L^2 space of square integrable function.
- Function of bounded variation are used to define generalization solution of nonlinear problems involving functional ,ordinary and partial differential equation in mathematics ,Physics and engineering.

Paper III – Topology -II

- The topic dealt in this paper serve as a foundation to facilitate students for research work in various branches of science.

Paper IV - Complex analysis-II

- The students should learn the basic techniques of contemporary Complex Analysis in various applications such as harmonic analysis differential equations as well as in the applied disciplines.
- formation of entire function with the help of weierstrass theorem ,Rhungi and Mittag Leffler's theorem .
- analytic continuation along a path and curve.
- understand Green's theorem ,which help to solve differential equations.
- able to find the order and rank of entire function exponent of convergence.
- learn the range of analytic function.

Paper V – Advanced Discrete Mathematics-II

- Graph theory used in modeling transport networks activity networks and theory of games.
- Graphs can be used to model many types of relations and process in physical, biological, social and information system.
- Graphs are used to represent networks of communication, data organization, computational device, the flow of computation etc.

- In computer science, finite state machine are widely used in modeling of application behavior, design of hardware digital system , software engineering , compilers , network protocols and the study of computational and languages.

M Sc. III Semester

Paper I - Integration theory and Functional analysis-I

- Raydon Nikodym theorem can be used to prove the existence of conditional expectation for probability measures.
- Borel set are used in descriptive set theory.
- Baire measures are convenient framework for integration on locally compact hausdorff space.

Paper II - PDE,Mechanics & Gravitation-I

Student will be able to

- its widely used in formulating many fundamental law of Physics and Chemistry .
- gain the vast knowledge by using the application of Calculus of variation in biological and medical field.
- develop the skill while doing using the various problem by using integral equation in all engineering sciences.
- demonstrate their understanding of how physical phenomenon Are modeled by differential equation.
- be familiar with the Modelling assumption and derivation that lead to p d e .
- Be competent is solving linear PDE using classical solution method.
- find the fourier and Laplace transformation its application.
- solve bondary value problem using fourier and laplacetransform.

Paper III – Programming in C (with ANSI Features)-I

At the end of course, Students will be able to

- ✓ Understand the fundamental programming concepts and methodologies which are essential to create good C programs.
- ✓ Code, test, and implement a well-structured, robust computer program using the C programming language.
- ✓ Write reusable modules (collections of functions).
- ✓ Understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing.

Paper IV – Fuzzy Sets and their applications-I

This paper gives an introductory idea of fuzzy sets and basic properties of fuzzy sets. This property has been introduced so that a student can fuzzify all the concepts of a crisp set. This paper acts as a tool for serving all types of research concerned with fuzzy sets.

Paper V - Operations research-I

- Operations research utilised in allocation and distribution in project and production and facility planning, in marketing, in finance sector etc.
- Network analysis used in construction projects based on the knowledge and experience of the past project for predicting accurately the time required for various activities during execution of project.
- Application of dual simplex method is that it works even when values are zero, easily implemented to solve any type of transportation problem.
- Assignment problem does the allocation in such a way that cost or time involved in process is minimum and profit or sale is maximum.

M Sc. IV Semester

Paper I -Integration theory and Functional analysis-II

- Hilbert space are used and functional analysis in quantum mechanics. Hilbert space support generalization of simple geometric concept like projection and change of basis from their usual finite-dimensional setting.
- Banach space allow us to transfer variable between the domain and codomain.
- Inner product space can be used to define Fourier coefficient for the series and that gives us a wide range of applications in boundary value problem(mainly heat and wave equation).

Paper II –PDE,Mechanics & Gravitation-II

- have a deep understanding of Newton's Law.
- to solve statistical mechanics problems.
- familiar with experimental techniques used in elementary practical physics.
- to understand the discipline specific knowledge in classical mechanics that is concept and Newton's law and application oscillation ,lagranges equivalent.
- to solve problem in Applied Physics .
- understand the Lagrange's and Hamiltonian approach in classical mechanics.
- get familiarized with Poisson and Lagrange's brackets and Hamilton Jacobi equations.
- kinematics and dynamics of rigid body in detail and ideas regarding Euler's equations.

- To apply calculus of variation to diverse problems in physics including isoperimetric problems, use of LaGrange multiplier in solving physics problems.

Paper –III Programming in C (with ANSI Features)-II

At the end of course, Students will be able to

- ✓ Understand the fundamental programming concepts and Operators, expressions to create good C programs.
- ✓ Understand the fundamental aspects of array to store data by using the C programming language.
- ✓ Understand structures and union concept for manage and storing different type of data items.
- ✓ Write reusable modules (collections of functions).
- ✓ Understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing.
- ✓ To learn how to passing parameters in the functions of the C program.

Paper IV – Fuzzy Sets and their applications-II

- In this paper students study the most successful application areas of fuzzy system called fuzzy control which finds extensive use in neural network.
- Decision making in fuzzy environment helps in how decisions are made involving single decision maker or multi decision makers. Students also learn fuzzy measure theory, probability theory, evidence theory which are used to characterize the various forms of uncertainty Students after attaining knowledge of fuzzy sets can apply her knowledge in research work in the field of medicine, economics, science and engineering , neural network and so on.

Paper V - Operations research-II

- Dynamic programming used in computer network, routing, graph problems, computer vision, artificial intelligence, machine learning etc.
- Valuable applications of queuing theory are traffic flow (vehicles, aircraft, people Communications, scheduling and facility design etc.). Queuing theory applicable to Healthcare settings where system have excess capacity to accommodate random variation.
- Nonlinear programming is the field of mathematical Optimization that deals with problem that are not linear.
- Game Theory is applied for determining different strategies in the business world.

B.Sc. Botany

Programme Outcome

1. Terminology, phenomenon, concepts and classification of plants and its scientific importance.
2. Introduction and awareness of the related flora (Biodiversity)
3. Practical aspects and knowledge of cell division and growth of plants.

Course Outcome

- 1. Biodiversity (Microbes, Algae, Fungi and Archegoniate):-**
Understanding regarding Microbes, Algae, Fungi, Bryophytes, Pteridophyta and Gymnosperms including general characteristics, classifications, morphology and anatomy reproduction and economic importance.
- 2. Cytology, Genetics and Molecular Biology:-**
Knowledge of cellular organization and their role in governing cellular processes. Knowledge of genetics, genetic interactions and basic genetics at molecular level.
- 3. Utilization of plant Resources:-**
Basic idea of Ethno botany folk medicines, herbal medicines. Study of Pharmacognosy of medicinally important plants. Assignments based on ethnic herbal medicinal plants.
- 4. Ecology and Systematic Botany :-**
Knowledge of ecosystem, plant communities, phytogeography, ecological factories and pollution study. Introduction with Hydrophytes and Xerophytes and approaches to the plant collection. Taxonomic description and Modern taxonomy.
- 5. Anatomy, Embryology and Economic Botany:-**
Knowledge of tissue, normal and abnormal secondary growth, embryology and cultivation of major cereals pulses vegetables spices timber and medicinal plants of Chhattisgarh state. Embryological slide preparation. Plants collection. Internal structure of Dicot and Monocot root stem and leaf etc.
- 5. Plant Physiology and Biotechnology:-**
Knowledge of plant water relation, metabolism, growth regulators, light and temperature effect and fundamentals of Biotechnology.

English Language

Course Outcome

UG

- Proficiency in reading and writing.
- To develop effective skills better social interaction and incalculable self directed learning.
- Analyze language at different language levels.
- Teach them the zeal of creativity by teaching them how to write.

M.Sc. Botany

Program Outcome

On completing under graduate and Post-graduate studies in Botany course, the students will be in position to understand:-

1. Terminology, phenomenon, concepts and classification of plants and its scientific importance.
2. Flora and fauna (Biodiversity) and its importance.
3. Application of botanical knowledge in day to day activities of life- cycle.
4. How to develop skills and abilities in handling of instruments during practical works.
5. Application of subject knowledge in day to day uses.
6. How to be in position to take up studies at post-graduate level and to further acquire good jobs.
7. General importance of Botany in day to day human and animal life.
8. Develop skills and abilities in practical work, handling instruments in laboratory experiments.
9. Research techniques and knowledge to undertake M.Phil., Ph.D. course after completion of Post Graduation.

Course Outcome

Semester-I

Paper I Cell And Molecular Biology:-

- To understand cellular mechanism at molecular level. Cytological slide preparation and knowledge to recombinants.

Paper II Genatics And Cytgenetics

- Introduction To modern tools and technics of cell biology(microscopy), cell componantes and their functions , cell cycleand cell division, geen structure regulation and expression in eukaryotes and mitochontrial and chloroplast genomes..

Paper III Physiology and Biochemistry:-

- To understand systematic position of vascular plants, classification of angiosperms with their phylogeny. Studies and knowledge of flora in lab and excursion. transpiration, respiration and nitrogen fixation. Flowering process, sensory photobiology and stress physiology. Chromatography and pigment separation To study energy flow, membrane transports enzymology, phytoharmones, photochemistry and photosynthesis. Detail study of Chromatographic studies of pigments and soil analytical studies.

Paper IV Recombinant DNA technology and protimics:-

To understand recombinant DNA technology , principles of gel electrophoresis genomic libraries PCR methodology, column cromatography and protimics us a tool for plant genetics breedins and diversity study.

Semester-II

Paper I Developmental Biology:-

- Knowledge of structure of archegoniatae, vascular plants various typeof growth anataomical studies in systamatics archeology climate studies formacology forensic sience biomedical research . development of flowers and seeds

Paper II pathogens and pests of crop plants :-

- Knowledge of life cycle of various type of viruses , bacteria fungi , insects and nematode intractions

Paper III Biotechnology and Resource Utilization:-

- Methodology of plant tissu culture . Biotechnology in forestry and biofertilizers study of plant resourse utilization

Paper I V Systamatics, Evolution And Environmental science:-

- To understand evolutionary biology and systematics of various plant species. Environmental science ecosystem and living organism application of environmental studies future of earth.

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Semester-III

Paper I Algae ,Environment Human Welfare:-

- Knowledge of diversity and distribution of algae, and their classification algal biotechnology micro and macroalgal biotechnology, biodiesel carbon capture by algae and industrial phycology

- **Paper II Principles of Ecology:-**

- To understand soil and vegetation patterns and their organization, climate and climate changes, ecosystem and green revolution. Ecological and dynamical studies of biotic and abiotic components hydro sere and Xerosere. Study in excursion (Visit to Buka and Satrenga dams.)

Paper III Advances in Archegoniatae:-

- To understand diversity of bryophytes and its role in ecosystem, interaction between micro organism and animals and fungus, poikilohydry, diversity of pteridophytes, gymnosperms, tissue culture method of conifers, diversity of non living gymnosperms

per IV Evolutionary Biology:-

- To understand evolution of various species of plants, diversity and its conservation.

Semester-IV

Paper I In vitro Technologies and Industrial Applications:-

- To understand plant tissue culture techniques micropropagation of floricultural, agricultural and pharmaceutical crops

Paper II Reproductive Biology of Flowering Plants:-

- Knowledge of modes of reproduction, development of gametophytes fertilization and breeding system in various plant species, fruit biology and seed biology.

Paper III molecular interaction of plants with symbionts, pathogens and pests:-

- To understand biotic interactions with plants, interaction between plants and bacteria, fungi, insects and nematode Engineering for the production of resistance plants major crop plant diseases and their control. Disease eliminating and innovative ideas for crop improvements.

Paper IV Advanced Plant Systematic:-

- Knowledge of plant systematics and taxonomic history, principles of botanical nomenclature classification and systematic evidence, molecular systematics phylogenetics. introduction of some basic angiospermic plants.

Department of Home Science Course Outcomes

Home science Faculty:- Performance of home science department is very appreciable. Focus is on skill development & making the student self confident via Tailoring, stitching, Knitting, Embroidery, Printing & tie & dye. Home furnishing materials preparation teaching, teaching kit & aids preparation, counseling, Toy making, Puppet making, Audio visual aids. Baby kit preparation, curtain, doormats, school port Folio Preparation, Food presentation, cooking of different recipes, therapeutic diets preparation low cost Nutrici os recipes preparation Running Canteen, Food science Experiments. Under many courses educational visits, survey, field work, are conducted for students to remain in touch with the different community & Industrials.

Our Students are Working In the field of NRC (nutrition rehabilitation centre). Feeding demonstrator, as school & college teacher working in Aanganwadi & Bal babies trainers, entrepreneurship at all small scale, leadership in the self help group, counselor, working as computer operator many of P.G. students have passed SET, TET, B.Ed. PSC Preliminary exams.

ARTS FACULTY

In our college there is study centre of Hindi Language & literature. Hindi language connects many works in diversity. It is base of national integrity. It gives opportunity to introduce India & Indian culture.

Study of applied Hindi helps students to work in education department as Hindi officer & translators also. Students follow work of journalism in different area. Hindi as contact language is popular in foreign country also. In the field of excursion it is also popular.

In Political Science Department is running two programmes namely M.A and PhD. Courses in the master's programme have been designed in a manner so as provide a holistic approach to the study of political science. The core of the discipline is maintained with courses on political philosophy both western and Indian and key concepts of politics. These courses provide a solid grounding to the learners on the history of ideas and the larger issues of epistemology in social sciences. They also try to integrate the concepts with the practices of politics and government and to understand their relevance in totality. The second set of papers on Indian politics including study of constitution, institutions, processes and political economy entail a detailed study and analysis of morphology and anatomy of politics in India. While familiarizing the students with legal framework of government institutions, the courses tend to engage them with the undercurrents of political practice and developmental process. By learning the evolution of concepts and theories of Indian politics, the students are able to critically reflect on the contemporary developments. Courses on comparative politics and international relations provide an overview of political developments at the global level. Comparative analysis not only helps in understanding the patterns of institutionalism, democratization and development in various polities but also provide a framework for explaining variations. In addition, specialized courses like human rights, peace and conflict studies and state politics introduces the students to certain new dimensions of politics. By doing these courses, students develop a solid footing over the vast field of knowledge in the discipline that also in a way encourages them to undertake future research in these unconventional areas of political science. Through them they also tend to develop an interdisciplinary focus without deviating from the core of the discipline. Research methodology is taught both in M.A and PhD programmes. While providing an epistemological and philosophical grounding on the subject, the course familiarizes the students with specialized techniques of qualitative and quantitative research in social sciences. The field work component of the course further trains the students to undertake field research and write research reports. Advance papers in M.A. Elective paper on Contemporary political theory, Tribal Studies and Public Policy further enhances the knowledge of students in these areas and also help them identify their areas of research.