

M.Sc. Mathematics

Course Outcome

Paper I Advanced Abstract Algebra-I

After completion of this course the students will be able to understand the composition series, Jordan-Holder Theorem, Solvable groups, Nilpotent Groups. Further they will understand Field Extension, Galois Theory and Solvability of polynomial equation using the Galois Theory.

Paper II Real Analysis-I

After completion of this course, students will be able to know the concept of integration, Convergence of Series and sequence of functions, point wise and uniform convergence. The students will be able to know how to read and write the proofs in Analysis. Another outcome includes the student able to the proof of several important theorems. They will know the variety of examples and counter examples in Real Analysis.

Paper III Topology-I

After completion of this course, students will be able to know the concept of integration, Know the definitions of important terms in Topology. The students will be able to know how to read and write the proofs in Topology. They will know the variety of examples and counter examples in Topology.

Paper iv Complex Analysis-I

In the End of the course, students will learn the fundamental concepts of Complex Integration, Contour Integration to evaluate the complicated Real Integrals using Residue calculus and also know how to construct Conformal mappings in which Hilbert space Ideas are used.

Paper v Programming in C

After the course the students are expected to be able to:

Identify situations where computational methods and computers would be useful.

Given a Computational problem, Identify and abstract the programming task involved.

Approach the programming tasks using techniques learned and pseudo-code.

Choose the right data representation formats based on the requirements of the problem.

Semester-II

Paper-I Advanced Abstract Algebra-I

After completion of this course the students will be able to understand the canonical forms and primary decomposition theorem, Module theory, Noetherian and artinian Modules, finitely generated modules over a PID and Rational canonical forms.

Paper II Lebesgue Measure and Integration

After completion of this course, students will be able to know the concept of Measure and integration, Lebesgue integration theory, Lebesgue differentiation. L_p space and some inequalities. Further they will learn Completeness of L_p space and convergence in measure and almost convergence theorem.

Paper III Topology-II

After completion of this course, students will know the definitions of important terms in Topology. The students will be able to know how to read and write the proofs in Topology. They will know the variety of examples and counter examples in Topology.

Paper IV Complex Analysis-II

In the End of the course, students will be able entire function in the form of canonical products. Also they knowing about theory related to convergence of infinite product and expression of well known functions in the form of infinite products.

Paper V Programming in C-II

After the course the students are expected to be able to:

Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand.

Write the program on a computer, edit compile, debug, correct, recompile and run it.

Identify tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

Semester-III

Integration Theory and functional Analysis-I

After completion of this course the students will be able to explain the fundamental concepts of functional analysis and their role in modern mathematics. Utilize the concept of functional analysis, for example continuous and bounded operators, normed spaces, Hilbert spaces, and to study of behaviour of different mathematical expressions arising in science and engineering.

Fundamentals of Computer science-I

After completion of this course, students will be able to demonstrate the use of mathematical programming and solve simple mathematical problems. Demonstrate the use of operating system commands and shell script.

Paper III Partial Differential equations-I

After completion of this course, students will be able to understand partial differential equations of first order (linear and nonlinear), second and higher order. Apply various analytic methods for computing solutions of various PDEs. Understand the formation and solution of some significant PDEs like wave equation, heat equation and diffusion equation. Apply the knowledge of PDEs and their solutions in order to understand the physical phenomena.

Paper iv Theory of Linear Operators-I

In the End of the course, students will have understanding of main topics of Banach Algebras and spectral theory. Terminology, notations, basic results and concepts of Banach and Hilbert Spaces. Understand the concept of spectrum and resolvent, adjoint operators, Compact Operators, self adjoint and normal operators, Positive Operators.

Paper v OR-I

After completion of this paper Students will be able to formulate and find solutions of linear programming problem, transportation problem and project evaluations. Also they may be able to find the shortest path of any network related problem in their daily-life.

Semester-IV

Functional Analysis-II

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

Distinguish between Hahn-Banach Spaces and Hilbert Spaces, Decompose a Hilbert Space in terms of orthonormal Sets

Classify operators into self adjoint, normal and unitary operators

Find projection mapping, projection theorem structure of Hilbert spaces

To explain Bessel's inequality, complete orthonormal sets and Parseval's identity.

Fundamentals of Computer science-II

After completion of this course, students will be able to understand that object oriented programs are organised around objects. Study how inheritance allows a class to be derived from an existing class without modifying it. Learn programming basics, viz, simple functions, call by value and reference, returning values of different type function overloading and recursive functions, Appreciate with examples structures and classes, static data, static function and array of objects.

Paper III Mechanics

This course can be followed by courses in Integral models, foundation of mechanics, Celestial mechanics. This prepares an adequate mathematical background for understanding any research papers in mechanics.

Paper iv Theory of Linear Operators-II

After studying this course the students will be able to explain regular spectral measure, real and complex spectral measure, Hellinger-Toeplitz theorem. Hilbert adjoint Operators. To explain spectral theorem for unitary and self-adjoint linear Operators. Multiplication Operator and differentiation Operator

Paper v OR-II

Due to its applicability in different sectors Operations research becomes very useful course in research field. After studying this course students may do their research work in different topics like Game theory, Job sequence, Network analysis, dynamical programming etc. Most of the companies hire OR technician to get maximum output of company.

Govt. College, Nagda