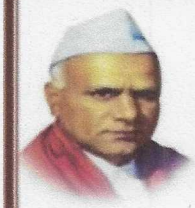


"Education for Knowledge, Science, and Culture"
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur

(Empowered Autonomous)

DEPARTMENT OF MATHEMATICS

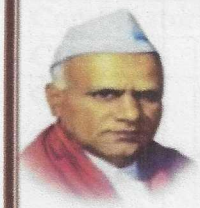
Course Outcomes (COS)

M.Sc. Part II Mathematics (Introduced in year 2024-25)	
Semester III	
Functional Analysis (DSC13MAT31)	
CO No.	**On completion of the course, the students will be able to:**
C01	To familiarize the students with the fundamental topics, principles and methods of functional analysis.
CO2	Understand and apply fundamental theorems from the theory of normed and Banach spaces, including the Hahn-Banach theorem, the open mapping theorem, the closed graph theorem.
CO3	Able to understand Hilbert space and its applications and acquire knowledge of orthogonal sets and operators.
CO4	Understand Adjoint of an operator on a Hilbert space and Concept of Positive, projection, self-adjoint, normal and unitary operator.
Classical Mechanics (DSC13MAT32)	
CO No.	**On completion of the course, the students will be able to:**
CO1	Discuss the motion of system of particles using Lagrangian & Hamiltonian approach
CO2	Solve extremization problem using Variational calculus.
CO3	Construct Hamiltonian using Routh process.
CO4	Use infinitesimal and finite rotation to analyse motion of rigid body.
Complex Analysis (DSC13MAT33)	
CO No.	**On completion of the course, the students will be able to:**
CO1	Know how to check given complex valued function is analytic or not.
CO2	Find power series expansion of an analytic function with radius of convergence.
CO3	Find zeros and singularities of complex valued functions.
CO4	Evaluate integral of complex valued functions along given curve.
Advanced Discrete Mathematics (DSC13MAT34)	
CO No.	On completion of the course, the students will be able to:
CO1	Solve discrete probability problems and use set to solve problems in combinatorics and probability theory
CO2	Determine if a given graph is simple or a multigraph, directed or undirected graph, cyclic or acyclic, and determine the connectivity of a graph.

Lattice Theory (DSE13MAT31)	
CO No.	**On completion of the course, the students will be able to:**
CO1	Understand the relation between posets and lattices
CO2	Study the basic properties and characterization of lattice
CO3	Understand and apply the distributive complemented lattice
CO4	Design analyse and implement the concepts of stone's theorem and its consequence, pseudo complemented lattices and it's dual
Fuzzy Mathematics-II (DSE13MAT32)	
CO No.	**On completion of the course, the students will be able to:**
CO1	Acquire the concept of fuzzy relations
CO2	Understand the basic concepts of fuzzy logic and fuzzy algebra
CO3	Construct approximate solutions of fuzzy relation equations
CO4	Solve problems in Engineering and medicine
Commutative Algebra (DSE13MAT33)	
CO No.	**On completion of the course, the students will be able to:**
CO1	Classify the ideals to solve the related problems.
CO2	Understand various radicals and know Hilbert basis theorem and apply it to other development.
CO3	Use Nakayama Lemma for further development in Noetherian Rings.
CO4	Derive the Krull intersection theorem

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

HEAD
DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)



"Education for Knowledge, Science, and Culture"
- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur

(Empowered Autonomous)

KOLHAPUR

DEPARTMENT OF MATHEMATICS

Course Outcomes (COS)

M.Sc. Part II Mathematics (Introduced in year 2024-25)	
Semester IV	
Field Theory (DSC13MAT41)	
CO No.	**On completion of the course, the students will be able to:**
C01	Apply the knowledge of algebra to attain a good mathematical maturity and enables to build mathematical thinking and reasoning
CO2	Identify and analyse different types of algebraic structures such as algebraically closed fields, splitting fields, finite field extension to understand and use the fundamental results in Algebra
CO3	Design analyse and implement the concepts of Gauss lemma, separable extension etc.
CO4	Identify the challenging problems in advanced algebra to pursue further research.
Integral Equation (DSC13MAT42)	
CO No.	**On completion of the course, the students will be able to:**
CO1	Solve linear Fredholm and Volterra Integral equations.
CO2	Compare properties of Differential and Integral equations.
CO3	Solve initial and Boundary value problems by converting to equivalent integral equations.
CO4	Analyse the properties of symmetric kernel.
Partial Differential Equations (DSC13MAT43)	
CO No.	**On completion of the course, the students will be able to:**
CO1	Classify partial differential equations and transform into canonical form
CO2	Solve boundary value problems for Laplace's equation, the heat equation, the wave equation by separation of variables, in Cartesian, polar, spherical and cylindrical coordinates
CO3	Use different method to solve boundary value problem specially use wave equations, Heat equations
CO4	Apply method of characteristics to find the integral surface of a quasi-linear partial differential equations.

Combinatorics (DSE13MAT41)	
CO No.	**On completion of the course, the students will be able to:**
CO1	Students will familiar with fundamental combinatorial structures than naturally appears in various other field of mathematics
CO2	Learn how to use those structure to represent mathematical applied questions.
CO3	Able to use generating function to solve a variety of combinatorial problems
CO4	Identify the challenging problems in arrangement and selections
Algebraic Number Theory (DSE13MAT42)	
CO No.	**On completion of the course, the students will be able to:**
CO1	Understand the concept (definition and significance) of algebraic numbers and algebraic integers.
CO2	Understand and clearly define number fields and their ring of integers, in particular quadratic number fields and cyclotomic number fields.
CO3	Able to factorise an algebraic integer into irreducible and find the ideals of an algebraic number ring.
CO4	Able to compute the class groups and the group of units of a number field.
Fractional Differential Equation (DSE13MAT43)	
CO No.	**On completion of the course, the students will be able to:**
CO1	Understand G-L and RL-fractional integral and evaluate fractional integrals of some common functions.
CO2	RL and Caputo-fractional derivatives and evaluate fractional derivatives of some common functions.
CO3	To Solve Linear Fractional Differential Equation using the Laplace and Mellin transform.
CO4	The study of fractional differential.

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

HEAD
DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)