

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Mr. S. P. Patankar

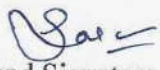
Programme - B.Sc. II

Semester - III

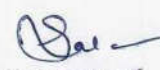
Subject: Mathematics

Course Title: Integral Calculus

Month October			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Beta and Gamma functions	1. Definition of Beta function 2. Basic Properties of Beta function and Examples on Beta functions 3. Definition of Gamma function 4. Basic Properties of Gamma function and Examples on Gamma functions 5. Relation between Beta and Gamma function
10	02	12		
Month November			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Multiple integrals	1. Integration Method of Evaluation 2. Related Double examples Cartesian and Polar Form 3. Change of order of integration 4. Change of Variable, Examples on Triple Integral.
12	02	14		


Name and Signature of Teacher




(S.P.Patankar)
HEAD
Department of Mathematics
Vivekanand College, Kolhapur

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Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Mr. S. P. Patankar

Programme - B.Sc. III

Semester - V

Subject: Mathematics

Course Title: Matrix Algebra

Month October			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Linear Transformation	1. Translation, Dilation, Rotation 2. Reflection in a point, line and plans. 3. Mauris form of basic geometric transformations.
12		12		
Month November			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Linear Transformation	1. Interpretation of eigen values and eigen vectors for such transformations and eigen spaces 2. Invariant subspaces. 3. Types of matrices. 4. Rank of a matrix. Invariance of rank under elementary transformations
12		12		
Month : December			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	System of Linear Equations	1. Reduction to normal form, 2. Solutions of linear homogeneous and non homogeneous equations with number of equations and unknowna upto four. 3. Matrices in diagonal form. Reduction to diagonal form upto matrices of order 3.
12		12		
Month : January			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	System of Linear Equations	1. Computation of matrix inversies using elementary row operations. Rank of matrix. 2. Solutions of a system of linear equations using matrices, Illustrative examples of above concepts from Geometry, Physics, Chemistry, Combinatorics and Statistics
12		12		


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Annual Teaching Plan

Name of the teacher: Mr. S. P. Patankar

Programme - B.Sc III

Semester - V

Subject: Mathematics

Course Title: Modern algebra

Month October			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Groups	
12		12		1. Definition and Binary operations 2. Definitions and properties, Groups elementary properties. 3. Finite groups and composition tables. 4. Subgroups and its properties. 5. Generators and cyclic groups. 6. Permutations Functions and permutations cycles and cyclic notation, even, odd, permutations, Symmetric group, Alternating groups.
Month November			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Groups	
12		12		1. Cyclic groups- elementary properties 2. The classification of cyclic groups 3. Isomorphisms -Definition and elementary properties. 4. Cayley's theorem, Groups of cosets, Applications. 5. Normal subgroups Factor groups, Criteria for existing of a coset group Inner automorphism and Dormal subgroups Simple groups 6. The fundamental theorems of isomorphisms, applications

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Name of Teacher: Mr. S. P. Patankar

Program: B.Sc. III

Subject: Mathematics

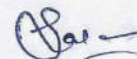
Semester: V

Course Title: CCPM-VI

Month: October			Unit I	Subunits Planed
Lectures	Practical	Total	Introduction	1) Introduction to Python
00	16	16		
Month: November			Unit II	Subunits Planed
Lectures	Practical	Total	Conditional statement	2) Expression and operators 3) Conditional statement
00	15	15		
Month: December			Unit III	Subunits Planed
Lectures	Practical	Total	Conditional statement	4) Looping and control statement
00	17	17		
Month: January			Unit IV	Subunits Planed
Lectures	Practical	Total	Functions	5) Functions



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Annual Teaching Plan

Name of the teacher: Prof. S.P. Thorat

Programme - B.Sc. I

Semester - I

Subject: Mathematics

Course Title: Calculus

Month: August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	1. Limit and Continuity	1) $\epsilon - \delta$ definition of limit of real valued function 2) Infinite limits 3) properties of continuous function 4) Types of discontinuity 5) Uniform continuity
8	01	09		
Month: September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	2. Mean value theorem and successive differential	1) Differentiability of real valued function 2) Relation between differentiability and continuity 3) Lagrange's mean value theorem 4) Successive differential equation 5) Leibnitz's theorem
10	01	11		
Month : October			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	3. Higher mean value theorem and indeterminate form	1) Maclaurin's and Taylor's theorems 2) Taylor's theorem infinite form with Lagrange and Cauchy forms of reminder 3) Indetermined Form
08	02	10		
Month : November			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	4. Asymptotes	1) Asymptotes of general algebraic cuvees 2) Asymptotes parallel to axes 3) Tangent at origin 4) Position and nature of double points
10	01	11		

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(Prof. S.P. Thorat)
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Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Prof. S. P. Thorat


Programme - B.Sc I

Semester - II

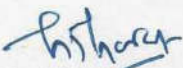
Subject: Mathematics

Course Title: Ordinary Differential Equation

Month: February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Differential Equation of first order and first degree	1)Differential Equation of first order and first degree 2)equation reducible to linear form 3)First order higher degree 4)Clairaut's Form 5)Picard's method and theorem for existence and uniqueness
10	01	11		
Month : March			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Linear Differential Equations with constant coefficient	1)Linear Differential Equations with constant coefficient 2)Complex and distinct roots and complex repeated roots 3)Mixed roots 4)Types of complimentary functions 5)Particular integrals of different functions
10	02	12		
Month : April			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Homogeneous linear Differential Equations	1) Homogeneous linear Differential Equations 2)Cauchy – Euler's Equation and methods of solving 3)Legendre's linear equations
08	01	09		
Month : May			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Differential equations with variable coefficient	1) General theory of linear differential equations with variable coefficient 2)Transformation of Equations 3)Bessel's equation 4) Bessel's functions and properties
08	01	09		


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(Prof.S.P.Thorat)
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Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Prof S.P. Thorat

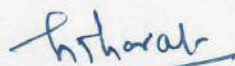
Program: B.Sc. II

Semester: IV

Subject: Mathematics

Course Title: Integral Transforms

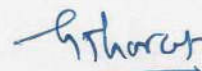
Month: February			Module/Unit I	Subunits Planed
Lectures	Practical	Total	Laplace transform	1) Existence theorem of Laplace transform 2) Laplace transform of Integrals 3) Laplace transform of Periodic function
08	02	10		
Month: March			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Inverse Laplace Transform and Application	1) Standard result of inverse Laplace Transform 2) Solving Linear differential equations with constant coefficient by Laplace transform
12	01	14		



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Annual Teaching Plan

Name of the teacher: Prof. S.P. Thorat

Programme - B.Sc III

Semester - V

Subject: Mathematics

Course Title: Numerical Method - I

Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Solution of algebraic equation	1. Introduction: Polynomial equation, algebraic equation and their roots 2. iterative methods, Bisection method, algorithm, examples 3. Secant algebraic method: iterative sequence of secant method, examples 4. Regula-Falsi method: algorithm, graphical representation, examples. 5. Newton's method: algorithm, examples.
12		12		
Month: September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Solution of algebraic equation	1. Introduction: System of linear equations as a vector equation $Ax = b$, Augmented matrix. 2. Direct methods: Gauss elimination method: Procedure, Examples 3. Gauss-Jordan method: Procedure, examples. 4. Iterative methods: General iterative rule
12		12		
Month : October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Iterative Methods	1. Jacobi iteration scheme, examples. 2. Gauss-Seidel method: Formula, examples. 3. Eigen values and eigenvectors of a real matrix
12		12		
Month : November			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Iterative Methods	1. Power method for finding an eigen value of greatest modulus, the case of matrix whose "dominant eigen value is not repeated", examples. 2. Method of exhaustion, examples, Method of reduction, examples. Shifting of the eigen value, examples
12		12		

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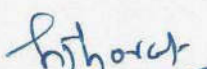
Programme - B.Sc. III

Semester - V

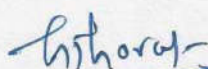
Subject: Mathematics

Course Title: Real Analysis

Month: August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Sequence and Series	<ol style="list-style-type: none"> The algebraic and ordered properties of \mathbb{R} Absolute value and real line, The completeness property of \mathbb{R} Application of supremum property, Intervals. Sequence, Limit of Sequence Monotone Sequences,
12		12		
Month: September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Sequence and Series	<ol style="list-style-type: none"> Subsequences and The Bolzano-Weierstrass Theorem The Cauchy Criterion, Property of Divergent Sequences Series: Definition and examples, n^k term Test, Cauchy Criterion for the series Comparison Tests Cauchy Condensation Test.
12		12		
Month : October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Riemann Integral and Improper Integral	<ol style="list-style-type: none"> The Riemann integral and properties Riemann integrable functions The squeeze Theorem, Classes of Riemann integrable functions The fundamental Theorem.
12		12		
Month : November			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Riemann Integral and Improper Integral	<ol style="list-style-type: none"> Improper integral of first kind, Comparison test, - test for Convergence convergence, Integral test for convergence of series Improper integral of second kind
12		12		


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Annual Teaching Plan

Name of the teacher: Prof. S.P. Thorat

Programme - B.Sc III

Semester - VI

Subject: Mathematics

Course Title: Metric Space

Month March			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Basic concepts of Metric Space	1. Definition and examples of metric spaces. 2. Open ball. Open set. Closed set as complement of open set, 3. Interior point and interior of a set. 4. Limit point and closure of a set. 5. Boundary point and boundary of a set. Properties of interior, closure and boundary. 6. Bounded set and diameter of a set. Distance between two sets. Subspace of a metric space.
12		12		
Month April			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Basic concepts of Metric Space	1. Convergent sequence. Cauchy sequence. 2. Every convergent sequence is Cauchy and bounded, but the converse is not true. 3. Completeness. Cantor's intersection theorem. \mathbb{R} is a complete metric space. \mathbb{Q} is not complete
12		12		
Month : May			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Compactness and connectedness of Metric Space	1. Continuous mappings, sequential criterion of continuity. 2. Uniform continuity. 3. Compactness, Sequential compactness, Heine-Borel theorem in \mathbb{R} . Finite intersection property, continuous functions on compact sets.
12		12		
Month : June			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Compactness and connectedness of Metric Space	1. Concept of connectedness and some examples of connected metric space, 2. connected subsets of \mathbb{R} , \mathbb{C} . 3. Contraction mappings, 4. Banach Fixed point Theorem and its application to ordinary differential equations.
12		12		

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S.P. Thorat

(Prof. S.P. Thorat)

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Vivekanand College, Kolhapur (Autonomous)
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Annual Teaching Plan

Name of Teacher: Prof. S.P.Thorat

Program: B.Sc. III

Semester: VI

Subject: Mathematics

Coarse Title: Core Course Practical In Mathematics (CCPM-V)

Month:			Module/Unit I	Subunits Planed
Lectures	Practical	Total	Interpolation	1) Newton's forward interpolation 2) Newton's backward interpolation
00	02	02		
Month: October			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Interpolation	1) Lagrangian interpolation 2) Divided difference interpolation
00	02	02		
Month: November			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Numerical integration	1) Trapezoidal rule 2) Simpson's 1/3ed rule
00	02	02		
Month: December			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Runge-Kutta Method	1) Second order Runge-Kutta method 2) Fourth order Runge-Kutta method
00	02	02		

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Vivekanand College, Kolhapur (Autonomous)

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Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Prof. S.P.Thorat

Programme - B.Sc III

Semester - VI

Subject: Mathematics

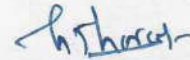
Course Title: Complex Analysis

Month February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Analytic Functions	<ol style="list-style-type: none">1. Basic algebraic and geometric properties of complex numbers2. Function of complex variable, Limits, continuity and differentiation3. Cauchy Riemann equations, Analytic functions and examples of analytic functions.
12		12		
Month: March			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Analytic Functions	<ol style="list-style-type: none">1. Exponential function, Logarithmic function, Trigonometric function,2. Definite integrals of functions, Contours, Contour integrals and its examples, upper bounds for moduli of contour integrals,3. Cauchy integral formula and examples.
12		12		



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Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Prof. S.P.Thorat

Programme - M.Sc.-II

Semester-III

Subject: Mathematics

Course Title: Number Theory

Month: September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Divisibility	1. Review of Divisibility: The division algorithm, G.C.D., 2. Euclidean algorithm, Diophantine equation $ax + by = c$, Primes and their distribution 3. Fundamental theorem of arithmetic
16		16		
Month October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Congruence	1. Congruences: Properties of congruences, 2. Linear congruences, Chinese Remainder Theorem 3. Special divisibility tests, Fermat's theorem, Wilson's theorem and applications.
17		17		
Month : November			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Number Theoretic function	1. Number Theoretic Functions: Euler's phi function, Euler's theorem 2. Greatest integer function, the functions τ and σ , Mobius function and Mobius inversion formula, Properties of these functions
22		22		
Month : December			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Primitive roots	1. Primitive roots: The order of an integer modulo n , Primitive roots of primes, composite numbers having primitive roots, 2. The theory of indices, The quadratic reciprocity law: Eulerian criteria 3. The Legendre symbol and its properties, quadratic reciprocity, quadratic reciprocity with composite moduli.
11		11		

S.P.Thorat
Name and Signature of Teacher



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Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Prof. G.B. Kolhe

Programme - B.Sc. I

Semester - I

Subject: Mathematics

Course Title: Algebra and Geometry

Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Theory of equation and complex number	1. Elementary theorem on the roots of equations 2. Synthetic division 3. Relations between the roots and coefficient of polynomial equations 4. Polar representation of complex numbers, De Moivre's theorem
10	01	11		
Month : September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Relations	1. Relation and equivalence relation 2. Functions, Composition of function 3. Finite sets, Countable and Uncountable sets
8	01	09		
Month : October			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Matrix algebra	1. System of linear equations 2. Row reduction and Echelon Form 3. Rank of matrix 4. Determinant and Inverse of matrix 5. Cayley-Hamilton theorem
08	02	10		
Month : November			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Spheres	1. Different forms of Spheres 2. Intersection of spheres 3. Tangents and Normal 4. Radical planes and line, Coaxial System
10	01	11		

G. B. Kolhe
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Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Mr. G.B. Kolhe

Program: B.Sc. II

Semester: III

Subject: Mathematics

Course Title: Number Theory

Month: August			Module/Unit I	Subunits Planed
Lectures	Practical	Total	Divisibility theory in the integers	1) Mathematical induction 2) Division Algorithm 3) Euclidean Algorithm 4) Diophantine equation
08	01	09		
Month: September			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Prime and their distribution	1) definition of prime number 2) fundamental theorem of arithmetic 3) Euclid's theorem
11	01	12		

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Vivekanand College, Kolhapur (Autonomous)
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Annual Teaching Plan

Name of Teacher: Mr. G. B. Kolhe

Program: B.Sc. II

Semester: III

Subject: Mathematics

Course Title: Core Course Practical In Mathematics (CCPM-III)

Month:			Module/Unit I	Subunits Planed
Lectures	Practical	Total	Introduction	1) Introduction to Scilab 2) Matrix
00	02	02		
Month: October			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Matrices	1) Accessing elements of matrices 2) Submatrix
00	02	02		
Month: November			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Matrices and Polynomials	1) Advanced Matrix operation 2) Polynomial
00	02	02		
Month: December			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Graph	1) Plotting graphs 2) Introduction to Scilab Programming
00	02	02		

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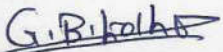
Program: B.Sc. II

Semester: IV

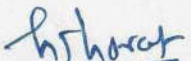
Subject: Mathematics

Course Title: Discrete Mathematics

Month: February			Module/Unit I	Subunits Planed
Lectures	Practical	Total	Recurrence relation	1) Models of Recurrence relation 2) linear Recurrence relation with constant coefficient 3) homogeneous solutions & Examples 4) particular solutions and Total solutions
12	02	14		
Month: March			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Generating function	1) Generating function 2) Basic properties of generating function 3) Application to solving recurrence relation
08	02	10		


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Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Mr. G. B. Kolhe

Program: B.Sc. II

Semester: IV

Subject: Mathematics

Course Title: Core Course Practical In Mathematics (CCPM-III)

Month: February			Module/Unit I	Subunits Planed
Lectures	Practical	Total	Interpolation	1) Numerical method to find the root of the given function 2) Interpolation
00	02	02		
Month: March			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Euler and Runge Kutta method	1) Numerical solution of Ordinary Differential Equation-I Euler's and Euler's Modified method 2) Numerical solution of Ordinary Differential Equation-II Runge Kutta Method
00	02	02		
Month: April			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Numerical Integration	1) Numerical Integration-I Trapezoidal rule 2) Numerical Integration-II Simpson's Rule
00	02	02		
Month: May			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Numerical Method	1) Numerical Method for solution of system of linear equations-I Guass-Jordan 2) Numerical Method for solution of system of linear equations-I Guass-Seidel
00	02	02		

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Annual Teaching Plan

Name of Teacher: Mr. G.B. Kolhe

Program: B.Sc. III

Semester: VI

Subject: Mathematics

Course Title: Core Course Practical In Mathematics (CCPM-IV)

Month:			Module/Unit I	Subunits Planed
Lectures	Practical	Total	2× 2 Games	1) Assignment problems (Unbalanced Problems) 2) Two by Two (2× 2) Games without saddle point
00	02	02		
Month: October			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Algebraic and Assignment Problems	1) Algebraic method of Two By two (2× 2) Games 2) Arithmetic method of Two By two (2× 2) Games
00	02	02		
Month: November			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Assignment Problems	1) Graphical method for $2 \times n$ games $m \times 2$ Games 2) Processing n jobs through 2 machines
00	02	02		
Month: December			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Assignment Problems	1) Processing n jobs through 3 machines 2) Processing 2 jobs through m machines 3) Processing n jobs through 2 machines
00	02	02		

G. B. Kolhe
 Name and Signature of Teacher
 (G. B. Kolhe)



S.P. Thorat
 (Prof. S.P. Thorat)
HEAD
 Department of Mathematics
 Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2021-2022

Annual Teaching Plan

Name of the teacher: G. B. Kolhe

Programme - B.Sc III

Semester - VI

Subject: Mathematics

Course Title: Numerical Method - II

Month: February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Interpolation	1. Forward interpolation: Newton's forward differences, forward difference table. Newton's forward form of interpolating polynomial (formula only) examples 2. Backward interpolation: Newton's backward differences, backward difference table, Newton's backward form of interpolating polynomial (formula only).
12		12		
Month :March			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Interpolation	1. Introduction, Lagrangian interpolating polynomial (formula only), examples 2. Divided difference interpolation:, Newton's divided differences, divided difference table, examples finding divided (differences of given data) 3. Newton's divided difference form of interpolating polynomial, examples
12		12		
Month :April			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Numerical Differentiation and Integration	1. Numerical differentiation based on interpolation polynomial. 2. Numerical integration: Newton-Cotes formula (statement only) 3. composite Trapezoidal rule 4. composite Simpson's 1/3rd rule, examples 5. composite Simpson's 3/8th rule, examples.
12		12		
Month : Mays			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Numerical Differentiation and Integration	1. Euler's Method, Examples, 2. Second order Runge-Kutta method (formula only). Examples 3. Fourth order Runge-Kutta method(formula only), examples
12		12		

G.B. Kolhe

Name and Signature of Teacher

(G.B. Kolhe)



S.P. Thorat

(Prof. S.P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of Mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Mr. Gaurav B. Kolhe

Programme: M. Sc. I

Semester: I

Subject: Mathematics

Course Title: Classical Mechanics

Month: Oct			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Lagrange's Equation	1) Lagrange's equation 2) examples on Lagrange's equation 3) Cyclic Coordinate and its properties
15	00	15		
Month: Nov			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Variational Calculus	1) Basic lemma of variational calculus, 2) Brachistochrone problem 3) geodesic, isoperimetric problems 4) Green's theorem
15	00	15		
Month: Dec			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Hamiltonian function	1) Hamilton's principle,
18	00	18		
Month: Jan			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Rigid Body and its motion	1) Kinematics of rigid body 2) Rigid body and its motion 3) Orthogonal transformations
17	00	17		

G. B. Kolhe

Name and Signature of Teacher



S. P. Thorat
(Mr. S. P. Thorat)

HEAD
Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Mr. G.B. Kolhe

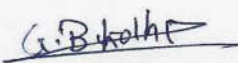
Program: M.Sc. II

Semester: IV

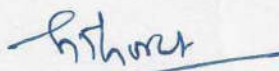
Subject: Mathematics

Course Title: Measure and Integration

Month: February			Module/Unit I	Subunits Planned
Lectures	Practical	Total	1. Lebesgue Measurable	1) Open Sets, Closed Sets and Borel Sets 2) Lebesgue Outer Measure, The sigma algebra of Lebesgue Measurable Sets, Countable Additivity 3) Continuity and Borel-Cantelli Lemma 4) nonmeasurable set.
16	00	16		
Month: March			Module/Unit II	Subunits Planned
Lectures	Practical	Total	2. Measurable Functions,	1) Sums, Product and Composition of Measurable Functions, 2) Sequential Pointwise limits and Simple Approximation. Littlewood's Three Principles 3) Egoroff's Theorem and Lusin's Theorem, Lebesgue 4) Integration of a Bounded Measurable Function, Lebesgue Integration of a Non-negative Measurable Function.
17	00	17		
Month: April			Module/Unit III	Subunits Planned
Lectures	Practical	Total	3. The general Lebesgue integral	1) The General Lebesgue Integral, 2) Characterization of Riemann and Lebesgue Integrability, 3) Differentiability of Monotone Functions, Lebesgue's Theorem, 4) Functions of Bounded Variations: Jordan's Theorem
18	00	18		
Month: May			Module/Unit IV	Subunits Planned
Lectures	Practical	Total	4. Absolutely Continuous Function	1) Absolutely Continuous Functions, 2) Integrating Derivatives: Differentiating Indefinite Integrals, 3) Normed Linear Spaces, Inequalities of Young, Holder and Minkowski, 4) The Riesz-Fischer Theorem.
16	00	16		


(Mr. G.B. Kolhe)




(S.P. Thorat)

HEAD
Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Mr. Avinash A. Patil


Programme - M.Sc.-I

Semester-I

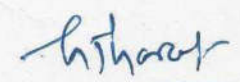
Subject: Mathematics

Course Title: Advanced Calculus

Month: September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Integral Calculus	1. Functions of Bounded Variation & Rectifiable Curves 2. Multiple Integral 3. Green's theorem 4. Surface integral 5. Curl & divergence
18		18		
Month: October			Module/Unit: I and II	Sub-units planned
Lectures	Practicals	Total	Integral Calculus	1. Stokes theorem 2. Gauss divergence theorem
15		15		
			Sequence & series of functions	1. Pointwise & uniform Convergence 2. Cauchy condition 3. Uniform convergence & Riemann integration 4. Uniform convergence & differentiation 5. Double sequence
Month: November			Module/Unit: II and III	Sub-units planned
Lectures	Practicals	Total	Sequence & series of functions	1. Mean convergence 2. Power series
22		22		
			Multivariable differential Calculus	1. Directional derivatives 2. Total derivative 3. Jacobian matrix 4. Chain rule 5. Mean value theorem
Month: December			Module/Unit: III and IV	Sub-units planned
Lectures	Practicals	Total	Multivariable differential Calculus	1. Taylor's formula 2. Inverse function theorem
12		12		
			Implicit functions	1. Implicit function theorem 2. Applications of implicit function Theorem


(Mr. A. A. Patil)
Name and Signature of Teacher




(Prof. S. P. Thorat)
HEAD
Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Avinash A. Patil

Programme - M.Sc.-II

Semester-III

Subject: Mathematics

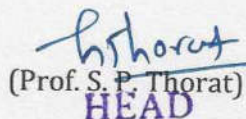
Course Title: Lattice theory

Month: September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Basic concepts of Lattice theory	1. Posets 2. Description of Lattices 3. Duality principle 4. Homomorphism & Isomorphism
16		16		
Month: October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Special types of Lattices	1. Distributive lattices 2. Modular lattices 3. Congruence relations 4. Boolean algebras
17		17		
Month: November			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Ideals	1. Ideal theory 2. Ideals and filters in lattices 3. Lattice of all ideals 4. Stone's theorem
21		21		
Month: December			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Pseudo lattices	1. Stone algebra 2. Pseudo complemented lattices 3. Stone lattices
12		12		



(Mr. A. A. Patil)

Name and Signature of Teacher



(Prof. S. P. Thorat)

HEAD

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Vivekanand College, Kolhapur

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Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Mr. Avinash A. Patil

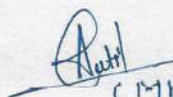
Programme: M.Sc.-I

Semester-II

Subject: Mathematics

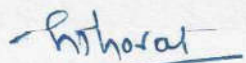
Course Title: Integral Equations

Month: September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Linear integral equations	1. Classification 2. Initial value problem 3. Boundary value problem 4. Separable kernel
16		16		
Month: October			Module/Unit: I and II	Sub-units planned
Lectures	Practicals	Total	Linear integral equations Solutions of Fredholm & Volterra integral equations	1. Homogeneous Fredholm equations & eigen functions 1. Successive approximations Method 2. Successive substitution Method 3. Adomian decomposition method 4. Resolvent kernel
17		17		
Month: November			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Symmetric kernels	1. Convolution type kernels 2. Symmetric kernels 3. Eigenvalues & eigenfunctions for symmetric kernels
20		20		
Month: December			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Hilbert Schmidt theorem	1. Hilbert Schmidt theorem 2. Solution of symmetric integral equations 3. Integrodifferential equations
16		16		


(Mr. A. A. Patil)

Name and Signature of Teacher




(Prof. S. P. Thorat)
HEAD

Department of Mathematics
Vivekanand College, Kolhapur

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Department of mathematics

Academic Year: 2021-2022

Annual Teaching Plan

Name of the teacher: Avinash A. Patil

Programme - M.Sc.-II

Semester-IV

Subject: Mathematics

Course Title: Combinatorics

Month: February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Permutations and combinations	1. The sum Rule and product Rule 2. Permutations and combinations 3. The Pigeonhole Principle 4. Ramsey Numbers, Catalan Numbers & Stirling Numbers
14		14		
Month: March			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Inclusion-Exclusion principle	1. Generalized Permutations & combinations 2. Inclusion - Exclusion principle 3. Derangements 4. Combinatorial Number theory
19		19		
Month: April			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Generating functions	1. Rook- Polynomial 2. Ordinary and Exponential generating functions 3. Recurrence Relations 4. Fibonacci sequence
23		23		
Month: May			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Group Theory in Combinatorics	1. Group Theory in Combinatorics 2. The Burnside Frobenius Theorem 3. Permutation Groups and Their Cycle Indices
12		12		

(Mr. A. A. Patil)

Name and Signature of Teacher



(Prof. S. P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

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Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of Teacher: Shital Manohar Malavi

Program: M.Sc. I

Semester: I

Subject: Mathematics

Coarse Title: Complex Analysis

Month: September			Module/Unit I	Subunits Planed
Lectures	Practical	Total	1. Analytic Functions	1. Power series, radius of convergence, 2. Analytic functions, zeros of an analytic function, 4. Cauchy-Riemann equations, 5. Harmonic functions, 6. Mobius transformations
16	00	16		
Month: October			Module/Unit II	Subunits Planed
Lectures	Practical	Total	2. Cauchy Integral	1. Power series representation of analytical function. 2. Liouville's theorem, Fundamental theorem of algebra, 3. Maximum modulus theorem, the index of closed curve, 4. Cauchy's theorem and integral formula, Moreira's theorem.
17	00	17		
Month: November			Module/Unit III	Subunits Planed
Lectures	Practical	Total	3. Singularities	1. Counting zero's, The open mapping theorem, Gearset's Theorem. 2. Classification of singularities, Laurent series development. Casorati- weierstrass theorem.
18	00	18		
Month: December			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	4. Residues	1. The argument principle, Rouche's theorem, the maximum principle. Schwarz's lemma 2. Residues, residues and its applications to characterize conformal maps.
16	00	16		

(Ms. Shital M. Malavi)

Malavi

(Name and Signature of Teacher)



S.P. Thorat

(Prof. S.P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Malavi Shital Manohar

Programme - M.Sc. I

Subject: Mathematics

Semester - II

Course Title: General Topology

Month February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	1. Topology and their basic terms	1. Topological spaces, Examples 2. Limit points, closed set and closure 3. Interior, Exterior, neighbourhood 4. Different ways of defining topology. 5. Bases, Subbases, subbases of topological subspaces
12	-	12		
Month March			Module/Unit: I and II	Sub-units planned
Lectures	Practicals	Total	1. Topology and their basic terms	1. Hereditary Properties
20	-	20	2. Connectedness and compactness in topological space	1 Connected spaces, components 2 connected subspaces of real line, compact space one point compactification, 3 continuous function
Month : April			Module/Unit: II and III	Sub-units planned
Lectures	Practicals	Total	2. Connectedness and compactness in topological space	1. Homeomorphisms 2. Topological Properties
22	-	22	3. Separation Axioms	1. Separation Axioms: T_0, T_1, T_2 spaces 2. First and second axiom spaces 3. Separable spaces 4. Lindelof spaces
Month : May			Module/Unit: III and IV	Sub-units planned
Lectures	Practicals	Total	3. Separation Axioms	1. Regular and T_3 spaces 2. Normal and T_4 space
14	-	14	4. Different types of Topological Spaces	1. Completely regular $T_{3/2}$ spaces 2. Completely normal and T_5 spaces 3. Product spaces

(Ms. Shital M. Malavi)

Malavi

Name and Signature of Teacher



Thorat

(Prof. S. P. Thorat)

HEAD
Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Malavi Shital Manohar

Programme - M. Sc I

Subject: Mathematics

Semester - II

Course Title: Numerical analysis

Month April			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Runge - Kutta Methods	<ol style="list-style-type: none">1. Runge - Kutta Method: second order methods2. the coefficient tableau, third order methods (without proof), order conditions,3. Fourth order methods (without proof)4. Implicit Range-kutta methods5. Stability characteristics,6. Taylor Series Methods: Introduction to Taylor series methods
18		18		
Month May			Module/Unit: III and IV	Sub-units planned
Lectures	Practicals	Total	Linear multistep methods	<ol style="list-style-type: none">1. Linear multistep methods: Adams Methods2. General form of linear multistep methods3. Predictor- corrector Adams methods,4. Starting Methods, Analysis of linear multistep methods:5. Convergence, consistency, sufficient condition for convergence, Stability Characteristics
16		16		

(Ms. Shital M. Malavi)

Name and Signature of Teacher



(Prof. S.P. Thorat)
HEAD

Department of Mathematics
Vivekanand College, Kolhapur

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Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Malavi Shital Manohar

Programme - M. Sc II

Subject: Mathematics

Semester - III

Course Title: Operational Research I

Month September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Convex Set	1. Convex sets and their properties 2. General formulation of linear programming 3. Fundamental Theorem of linear programming
13		13		
Month October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Simplex Method and Duality	1. Simplex method 2. Revised simplex method in standard form I 3. Duality in linear programming
15		15		
Month : November			Module/Unit: II and III	Sub-units planned
Lectures	Practicals	Total	Simplex Method and Duality	1. Integer linear programming 2. Gomory's cutting plane method 3. Branch and Bound method.
21		21		
			Dynamic programming	1. Dynamic programming. 2. Bellman's principle of Optimality 3. Application of dynamic programming in production
Month : December			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Non- Linear Programming Problem	1. Non- linear programming unconstrained problems of maximum and minimum 2. Lagrangian method 3. Kuhn Tucker necessary and sufficient conditions, 4. Wolfe's method, 5. Beale's method.
15		15		

(Ms. Shital M. Malavi)

Name and Signature of Teacher



(Prof. S. P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Shital Manohar Malavi

Programme - M.Sc.-II

Semester-III

Subject: Mathematics

Course Title: Advanced Discrete mathematics

Month: September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Graph Theory	1. Graph Theory: Definition, examples and properties, 2. Graph isomorphism, Bipartite graphs, Complete Bipartite graph, regular graph, sub-graphs spanning sub-graph, 3. Edge deleted sub-graph, Vertex deleted sub-graph, Union and intersection of two graphs, complements of a graph
16		16		
Month: October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Tree	1. Matrix representation of graph 2. Properties of tree 3. Bridges & spanning trees 4. Inclusion exclusion principle 5. Pigeonhole principle
17		17		

(Ms. Shital M. Malavi)

malavi

Name and Signature of Teacher



Thorat
(Prof. S. P. Thorat)
HEAD
Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Malavi Shital Manohar

Programme - M. Sc II

Subject: Mathematics

Semester - IV

Course Title: Operational Research II

Month February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Replacement Policy	1.Replacement Problems 2.Failure mechanism of items 3.Replacement policy for items whose maintenance cost increases with time and money values is constant 4.Group replacement of items that fail completely
13		13		
Month March			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Inventory Models	1. Inventory – Cost involved in inventory problems 2. variables in inventory problem, symbols in inventory concept of EOQ, 3. Methods with calculus method 4. Model I (a) The economic lot size system with uniform demand 5. Model I (b) Economic lot size with different rates of demand in different cycles. 6. Model I (c) Economic lot size with finite Rate of Replenishment, (EOQ production model) 7. EOQ model with shortages
22		22		
Month : April			Module/Unit: II and III	Sub-units planned
Lectures	Practicals	Total	Inventory Models	1. Model II(a) The EOQ with constant rate of demand, scheduling, time constant.
21		21		

			Queuing Theory	<ol style="list-style-type: none"> 1. Queuing Theory 2. Queuing systems 3. Queuing Problems: transient and steady states, traffic intensity, Probability distributions in Queuing systems 4. Poisson process, Properties, Exponential process, 5. Classification of Queuing Models
Month : May			Module/Unit: III and IV	Sub-units planned
Lectures	Practicals	Total	Queuing Theory	<ol style="list-style-type: none"> 1. Model I:(M/M/I): (∞/FCFS), Model II (a): General Erlang queuing model.
15		15	Information Theory	<ol style="list-style-type: none"> 1. Information Theory: Communication process, Quantitative measure of information 2. Uniqueness theorem, Chanel capacity, efficiency and redundancy Encoding, Shannon Fano encoding procedure 3. PERT / CPM: Applications of PERT /CPM techniques, 4. Network diagram, representations. Rules for constructing the Network diagram 5. determination of the critical path.

(Ms. Shital M. Malavi)

Malavi

Name and Signature of Teacher

S. P. Thorat

(Prof. S. P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of Mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Kulkarni Prajakta Prasad

Programme: M. Sc. I

Subject: Mathematics

Semester: I

Course Title: Modern Algebra

Month: September			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Simple Groups	1) Simple groups, simplicity of A_n , Commutator subgroups, 2) Normal subgroup and subnormal series, Jordan-Holder theorem 3) Solvable groups, Nilpotent group, isomorphism theorems (Statement only) 4) Zassenhaus Lemma, Schreier refinement theorem.
18	00	18		
Month: October			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Group Action	1) Group action on a set, isometry subgroups, Burnside theorem 2) Direct product and semidirect product of groups, Sylow theorems, p-subgroups, 3) Group of order and pq, 4) Class equation and applications
15	00	15		
Month: November			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Rings of Polynomial	1) Ring of Polynomials, Factorization of polynomials over fields, 2) Irreducible polynomials, Eisenstein criterion, ideals in $F[x]$, unique 3) factorization domain, principal ideal domain 4) Gauss lemma, Euclidean Domain
17	00	17		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Module	1) Modules, sub-modules, quotient modules, 2) homomorphism and isomorphism theorems, fundamental theorem for modules 3) completely reducible modules, free modules.
16	00	16		

(Ms. P.P. Kulkarni)

(S. P. Thorat)



HEAD
Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of Mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Kulkarni Prajakta Prasad

Programme: M. Sc. I

Subject: Mathematics

Semester: II

Course Title: Linear Algebra

Month: February			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Vector Spaces and Quotient Spaces	1) Direct sum of a vector space 2) Dual Spaces, Annihilator of a subspace, 3) Quotient Spaces 4) Algebra of Linear transformations.
15	00	15		
Month: March			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Inner Product Space	1) Adjoint of a linear transformation, Inner product spaces 2) Eigen values Eigen vectors of a linear transformation 3) Diagonalization 4) Invariant subspaces
15	00	15		
Month: April			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Canonical forms and Jordan forms	1) Canonical forms, Similarity of linear transformations 2) Reduction to triangular forms, Nilpotent transformations 3) Primary decomposition theorem, Jordan blocks and Jordan forms 4) variants of linear transformations
18	00	18		
Month: May			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Self adjoint linear transformation	1) Hermitian, Self adjoint, Unitary and normal linear transformation 2) Symmetric bilinear forms 3) skew symmetric bilinear forms 4) Group preserving bilinear forms
17	00	17		

P. Kulkarni

(Ms. P.P. Kulkarni)



S.P. Thorat

(S.P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

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Department of Mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Kulkarni Prajakta Prasad

Programme: M. Sc. I

Subject: Mathematics

Semester: II

Course Title: Numerical Analysis

Month: February			Module/Unit: I	Sub-units planned
Lectures	Practical	Total	Rate of Convergence	
17	00	17		1) Rate of convergence of Secant Method, Regula -Falsi Method and Newton-Raphson Method 2) Bairstow method, Matrix factorization methods (Doo little reduction, Crout reduction) 3) Eigen Values and eigenvectors 4) Gerschgorin theorem, Breuer theorem, Jacobi Method for symmetric matrices.
Month: March			Module/Unit: II	Sub-units planned
Lectures	Practical	Total	Numerical integration	
16	00	16		1) Numerical Integration: Error estimates of trapezoidal and Simpson's Numerical integration rule. 2) Gauss- Legendre integration Methods (n= 1, 2) 3) Lobatto Integration Method (n = 2) 4) Radau Integration method (n=2) and their error estimates

P. P. Kulkarni

(Ms. P.P. Kulkarni)



S. P. Thorat

(S. P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Kulkarni Prajakta Prasad

Programme - M. Sc.II

Subject: Mathematics

Semester - III

Course Title: Function Analysis

Month: September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Normed linear space	1. Normed linear spaces, 2. Banach spaces, 3. Quotient spaces, 4. Continuous linear transformations, 5. Equivalent norms, Finite dimensional normed spaces and properties,
16		16		
Month: October			Module/Unit: I and II	Sub-units planned
Lectures	Practicals	Total	Normed linear space	1. Conjugate space and separability 2. The Hahn-Banach theorem and its consequences.
17		17	Conjugate space	1. Second conjugate space 2. the natural embedding of the normed linear space in its second conjugate space 3. Reflexivity of normed spaces 4. Weak * topology on the conjugate space. 5. The open mapping theorem.
Month: November			Module/Unit: II and III	Sub-units planned
Lectures	Practicals	Total	Conjugate space	1. Projection on Banach space 2. the closed graph theorem, the conjugate of an operator 3. the uniform boundedness principle.
19		19	Hilbert Space	1. Hilbert spaces: examples and elementary properties 2. Orthogonal complements, 3. The projection theorem, Orthogonal sets 4. The Bessel's inequality, 5. Fourier expansion and Parseval's equation 6. separable Hilbert spaces.
Month: December			Module/Unit: III and IV	Sub-units planned
Lectures	Practicals	Total	Hilbert Space	1. The conjugate of Hilbert space, Riesz's theorem, 2. The adjoint of an operator.
16		16	Types of operators	1. Self adjoint operators, 2. Normal and Unitary operators 3. Projections, Eigen values and eigenvectors of an operator on a Hilbert space 4. The determinants and spectrum of an operator, The spectral theorem on a finite dimensional Hilbert space.

Prajkta

Ms. Kulkarni Prajakta Prasad



Thorat
(Mr. S. P. Thorat)

HEAD
Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Kulkarni Prajakta Prasad.

Programme - M.Sc.-II

Semester-III

Subject: Mathematics

Course Title: Advanced Discrete mathematics

Month: November			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Recurrence relation	1. Discrete numeric functions 2. Generating functions 3. Linear recurrence relations
19		19		
Month: Decembers			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Lattice theory	1. Hasse diagram 2. Lattices 3. Types of lattices 4. Boolean algebra
16		16		

P.P. Kulkarni

(Ms. P.P. Kulkarni)



S.P. Thorat

(S. P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of Mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Kulkarni Prajakta Prasad

Programme: M. Sc. II

Subject: Mathematics

Semester: IV

Course Title: Field Theory

Month: February			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Field Extension	1) Field Extensions Extension of a field 2) Algebraic extensions, algebraically closed fields 3) Derivatives and multiple roots 4) Finite Fields.
18	00	18		
Month: March			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Galois Theory	1) Galois Theory 2) Separable and normal extensions 3) Automorphism groups and fixed fields 4) Fundamental theorem of Galois theory
15	00	15		
Month: April			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Finite fields	1) Finite Fields, Prime fields 2) Fundamental theorem of algebra 3) Cyclic extensions 4) Cyclotomic extensions
17	00	17		
Month: May			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Polynomials solvable by radicals	1) Applications of Galois theory 2) Constructions by ruler and compass 3) Solvable groups, 4) Polynomials solvable by radicals
16	00	16		

P. P. Kulkarni

(Ms. P.P. Kulkarni)



S. P. Thorat

(S. P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Mrudula Gurunath Goliwadekar

Programme - B.Sc. I

Semester - II

Subject: Mathematics

Course Title: Multivariable Calculus

Month : February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Partial Differentiation	1. Functions of several variables 2. Level curves and surfaces 3. Partial Differentiation Chain Rule 4. Direction Derivatives 5. Tangent plans and normal lines
08	01	09		
Month : March			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Jacobian	1. Higher order partial derivatives 2. Jacobians, Change of variables 3. Euler's Theorem 4. Taylor's Theorem for functions of two variables and more variables
10	01	11		

Name and Signature of Teacher

(Mrudula G. Goliwadekar)



(Prof. S.P. Thorat)
HEAD

Department of Mathematics
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Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Ms. M. G. Goliwadekar

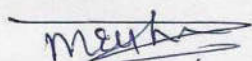
Program: B.Sc. II

Semester: IV

Subject: Mathematics

Course Title: Integral Transforms

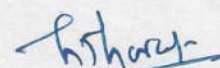
Month: April			Module/Unit III	Subunits Planned
Lectures	Practical	Total	Fourier Transform	1) Infinite Fourier Sine and Cosine transform 2) Relationship between Fourier Transform and laplace transform
08	02	10		
Month: May			Module/Unit IV	Subunits Planned
Lectures	Practical	Total	Finite Fourier Transform And Inverse, Fourier Integrals	1) Finite Fourier Transform And Inverse, Fourier Integrals 2) Finite Inverse Fourier Transform And Inverse, Fourier Integrals
09	02	11		



Name and Signature of Teacher

(Msudula G. Goliwadekar)





(Prof. S.P. Thorat)

HEAD

Department of Mathematics
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Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Ms. M.G. Goliwadekar

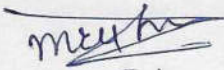
Program: B.Sc. III

Semester: V

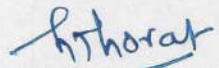
Subject: Mathematics

Coarse Title: Core Course Practical In Mathematics (CCPM-V)

Month: August			Module/Unit I	Subunits Planed
Lectures	Practical	Total	Iterative Method	1) Bisection Method 2) Secant Method
00	02	02		
Month: September			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Iterative Method	1) Newton's Method 2) Guass-Elimination Method
00	02	02		
Month: October			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Numerical Method	1) Guass Jordan Method 2) Jacobi Iteration scheme
00	02	02		
Month: November			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Numerical Method	1) Guass- Seidel Method 2) Power Method
00	02	02		


Name and Signature of Teacher
(Mrudula G. Goliwadekar)




(Prof. S.P. Thorat)
HEAD
Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Ms. M. G. Goliwadekar

Program: B.Sc. III

Semester: V

Subject: Mathematics

Coarse Title: Core Course Practical In Mathematics (CCPM-IV)

Month: August			Module/Unit I	Subunits Planed
Lectures	Practical	Total	Introduction to LPP	1) Graphical method for Linear Programming Problem 2) Transportation Problems (North west corner rule)
00	02	02		
Month: September			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Transportation and Assignment-I	1) Transportation Problems (Lowest Cost Entry Method) 2) Transportation Problems (Vogel Approximation Method)
00	02	02		
Month: October			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Transportation and Assignment-II	1) Transportation Problems (Test For Optimality MODI Method) 2) Transportation Problems (Hungarian Method)
00	02	02		
Month: November			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Transportation and Assignment-III	1) Assignment Problems (Maximization Case) 2) Assignment Problems (Traveling Salesman Problem)
00	02	02		

Name and Signature of Teacher

(Mrudula G. Goliwadekar)



(Prof. S.P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

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Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. M.G. Goliwadekar

Programme - B.Sc III

Semester - VI

Subject: Mathematics

Course Title: Linear algebra

Month March			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Vector Space	<ol style="list-style-type: none"> 1. Vector spaces, General properties of vector spaces, 2. Vector subspaces, Algebra of subspaces 3. linear combination of vectors, Linear span, linear sum of two subspaces 4. Linear dependence and independence of vectors 5. Basis of vector space Finite dimensional vector space, Dimension of a vector space, Dimension of subspace
12		12		
Month April			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Vector Space	<ol style="list-style-type: none"> 1. Linear transformations, linear operators 2. Range and null space of linear transformation 3. Rank and nullity of linear transformation 4. Linear transformations as vectors product of linear transformations, Invertible linear transformation.
12		12		
Month : May			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Inner product space	<ol style="list-style-type: none"> 1. The adjoint or transpose of a linear transformation 2. Sylvester's law of nullity, characteristic values and vectors of linear transformation 3. Cayley Hamilton theorem, Diagonalisable operators,
12		12		
Month : June			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Inner product space	<ol style="list-style-type: none"> 1. Inner product spaces, Euclidean and unitary. 2. Norm or length of vector, Schwartz inequality, 3. Orthogonality, Orthonormal set, complete orthonormal set 4. Gram-Schmidt ortogonalisation process.
12		12		

M.G. Goliwadekar

Name and Signature of Teacher

(Mridwa G. Goliwadekar)



S.P. Thorat

(Prof. S.P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Ms. Mrudula Gurunath Goliwadekar

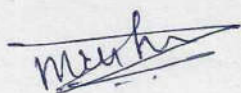
Program: B.Com. I

Semester: I

Subject: Mathematics

Course Title: Business Mathematics Paper-I

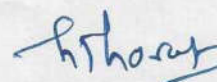
Month: August			Module/Unit I	Subunits Planned
Lectures	Practical	Total	Arithmetic and Geometric progression	1) Definition of A.P. and G.P. 2) Formulae for n^{th} term and sum to n terms of A.P. and G.P.
16	00	16		
Month: September			Module/Unit II	Subunits Planned
Lectures	Practical	Total	Compound interest, ratio, percentage, proportion and partnership	1) Different types of interest rates 2) Concept of proportion 3) Application to division into proportional part and partnership
17	00	17		
Month: October			Module/Unit III	Subunits Planned
Lectures	Practical	Total	Matrices and Determinants	1) Definition of matrix, Types of Matrices 2) Finding inverse of matrix by using adjoint matrix 3) Solution of system of linear equations by Cramer's rule
15	00	15		
Month: November			Module/Unit IV	Subunits Planned
Lectures	Practical	Total	Linear programming problem (L.P.P.)	1) Formation of L.P.P. 2) Graphical method of solution 3) Problem relating to two variables including the case of mixed constraints
16	00	16		



Name and Signature of Teacher

(Mrudula G. Goliwadekar)





(S. P. Thorat)

HEAD

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Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2021-2022

Annual Teaching Plan

Name of the teacher: Ms. Mrudula Gurunath Goliwadekar


Programme - M.Sc.-I

Semester-I

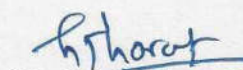
Subject: Mathematics

Course Title: Ordinary Differential Equations

Month: September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Linear Equations with constant coefficients	1. Second order homogeneous Equations 2. Linear dependence & dependence 3. Non-homogeneous equations of order two 4. Homogeneous equations of order n
15		15		
Month: October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	The non-homogeneous equation of n^{th} order	1. The non-homogeneous equation of n^{th} order 2. Linear Equations with variable Coefficients 3. Wronskian and linear dependence 4. Reduction of order of homogeneous equation
17		17		
Month: November			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	The Euler equations	1. Sturm Liouville theory 2. Homogeneous equations with analytic coefficients 3. The legendre equations 4. Linear Equations with regular singular points 5. The Euler equations
20		20		
Month: December			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Successive approximations	1. The Bessel equation 2. Regular singular points at infinity 3. Existence and uniqueness of solutions: The method of successive approximations 4. The Lipschitz condition
13		13		



Name and Signature of Teacher



 (Prof. S. P. Thorat)
HEAD

 Department of Mathematics
 Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Ankita Mahipati Sathe

Programme - B.Sc. I

Semester - II

Subject: Mathematics

Course Title: Multivariable Calculus

Month : April			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Extreme values	1. Extreme values 2. Necessary condition for extreme values 3. Sufficient condition for extreme values 4. Lagrange's method
06	02	08		
Month : May			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Vector Calculus	1. Differential of vectors 2. tangent line to curves gradient and divergence and curl 3. Solenoidal and irrotational vector 4. vector identities
11	01	12		

Name and Signature of Teacher

(Ankita M. Sathe)



(Prof. S.P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Ms. Ankita Mahipati Sathe

Program: B.Sc. II

Semester: III

Subject: Mathematics

Course Title: Number Theory

Month: October			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Theory of congruences	1) Definition of congruence 2) Basic properties of congruence 3) Fermat's theorem and their examples 4) Examples on Wilsons theorem
12	01	13		
Month: November			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Number-Theoretic Function	1) The sum and Number of divisors and it's examples 2) Greatest integer function 3) Euler's Phi-function 4) Some properties of the Phi-function
09	01	10		

Ankita

Name and Signature of Teacher
 (Ankita M. Sathe)



S.P. Thorat

(Prof. S.P. Thorat)

HEAD

Department of Mathematics
 Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Ms. Ankita M. Sathe

Program: B.Sc. II

Semester: III

Subject: Mathematics

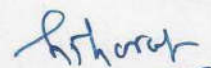
Course Title: Integral Calculus

Month: October			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Multiple Integral	1) Double Integration: Method of evaluation and related examples 2) Change of variable
12	01	13		
Month: November			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Fourier Series	1) Periodic function 2) Fourier Series Expansion of elementary function 3) Half range series expansion
09	00	09		



Name and Signature of Teacher

(Ankita M. Sathe)



(Prof. S.P. Thorat)

HEAD

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Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Ms. Ankita M. Sathe

Program: B.Sc. II

Semester: IV

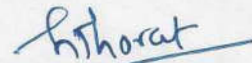
Subject: Mathematics

Course Title: Discrete Mathematics

Month: April			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Basics of Graph Theory	1) Types of Edges 2) Degree of vertex 3) Handshaking lemma
10	02	12		
Month: May			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Paths and Circuits	1) Paths, cycle, Circuit 2) Operations of Graph 3) types of Graph
11	02	13		



Name and Signature of Teacher
(Ankita M. Sathe)



(Prof. S.P. Thorat)

HEAD
Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Ankita M. Sathe

Programme - B.Sc III

Semester - V

Subject: Mathematics

Course Title: Modern algebra

Month : October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Field	
12	00	12		1. Definition and basic properties 2. Fields, Integral domains, divisors of zero and cancellation laws 3. The characteristic of a ring, some non commutative rings Examples
Month : November			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Field	
12	00	12		1. matrices over a field, The real quaternions 2. Homomorphism of rings Definition and elementary properties 3. Maximal and Prime ideals, Prime fields

Ankita

Name and Signature of Teacher

(Ankita M. Sathe)



S.P. Thorat

(Prof. S. P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur

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Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. A. M. Sathe

Programme - B.Sc III

Semester - VI

Subject: Mathematics

Course Title: Complex Analysis

Month : April			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Singularities	
12		12		1. Convergence of sequences and series of complex variables 2. Taylor series and its examples, Laurent series and its examples, absolute and uniform convergence of power series. 3. Isolated singular points
Month : May			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Singularities	
12		12		1. Residues, Cauchy's residue theorem, Residue at infinity, The three types of isolated singularities, Residues at poles and examples 2. Zeros of analytic functions, Zeros and poles 3. Application of residue theorem to evaluate real integrals

Name and Signature of Teacher

(Ankita M. Sathe)



(Prof. S.P. Thorat)

HEAD

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Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Ms. A.M. Sathe

Program: B.Sc. III

Semester: VI

Subject: Mathematics

Coarse Title: Core Course Practical In Mathematics (CCPM-VI)

Month: February			Module/Unit I	Subunits Planned
Lectures	Practical	Total	System of linear algebraic equations	1) System of linear algebraic equations 2) Roots of equations
00	02	02		
Month: March			Module/Unit II	Subunits Planned
Lectures	Practical	Total	Initial value problem	1) Initial value problem 2) Magic square and area calculation without measurement
00	02	02		
Month: April			Module/Unit III	Subunits Planned
Lectures	Practical	Total	Graph Theory	1) Graph Theory: Network 2) Collaz conjuncture and monte Hall problem
00	02	02		
Month: May			Module/Unit IV	Subunits Planned
Lectures	Practical	Total	Data visualization in Python	1) Data compressing using Numpy 2) Data visualization in Python
00	02	02		

Ankita

Name and Signature of Teacher

(Ankita M. Sathe)



S.P. Thorat

(Prof. S.P. Thorat)

HEAD

Department of Mathematics
 Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)
Department of mathematics
Academic Year: 2022-2023
Annual Teaching Plan

Name of Teacher: Ms. Ankita Mahipati Sathe

Program: B.Com. I

Semester: II

Subject: Mathematics

Course Title: Business Mathematics Paper-II

Month: February			Module/Unit I	Subunits Planed
Lectures	Practical	Total		
16	00	16	Functions of real variable, Limit of function and continuity	1) Linear, Quadratic, exponential (of type $y = a^x$) 2) Limit of function- Theorems on Limit 3) Continuity of a function at a point, discontinuity of a function 4)Algebra of continuous function
Month: March			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Differentiation	
17	00	16		1) Definition, derivative using first Principle 2) Method of differentiation of sum, difference, product, quotient of two functions 3) Second order derivative
Month: April			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Application of differentiation	
16	00	16		1) Maxima and minima 2) Case of one variable involving second order derivatives 3) Elasticity of demand
Month: May			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Integration and its application	
17	00	17		1) Integration-An Anti derivative Process, Standard forms 2) Method integration by substitution and by parts 3) Definite integral and their Properties

(Signature)

Name and Signature of Teacher
(Ankita M. Sathe)



(Signature)

(S. P. Thorat)
HEAD

Department of Mathematics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of mathematics

Academic Year: 2022-2023

Annual Teaching Plan

Name of the teacher: Ms. Ankita Mahipati Sathe

Programme - M.Sc. I

Subject: Mathematics

Semester - II

Course Title: Partial Differential Equations

Month February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	1. Partial Differential Equation	1. First order Partial Differential Equations 2. Linear equations of first order. 3. Pfaffian differential equations 4. Compatible systems of first order partial differential equations.
14	-	14		
Month March			Module/Unit: I and II	Sub-units planned
Lectures	Practicals	Total	1. Partial Differential Equation	1. Compatible systems of first order partial differential equations.
20	-	20	2. Non-Linear Partial Differential Equation	1. Charpits method, 2. Jacobi method of solving partial differential equations, 3. Cauchy Problem,
Month : April			Module/Unit: II and III	Sub-units planned
Lectures	Practicals	Total	2. Non-Linear Partial Differential Equation	1. Method of characteristics to find the integral surface of a quasi linear partial differential equations.
22	-	22	3. Higher Order Partial Differential Equation	1. Second order Partial Differential Equations. 2. Classification of second order partial differential equation. 3. Vibration of an infinite string 4. Method of separation of variables
Month : May			Module/Unit: III and IV	Sub-units planned
Lectures	Practicals	Total	3. Higher Order Partial Differential Equation	1. Uniqueness of solution of wave equation 2. Cauchy problems.
14	-	14	4. Boundary Value Problems:	1. Laplace equation, Solution of Laplace equation, 2. Dirichlets problems and Neumann problems. 3. maximum and minimum principles 4. Stability theorem.

Ankita

Name and Signature of Teacher



S. P. Thorat
(Prof. S. P. Thorat)

HEAD

Department of Mathematics
Vivekanand College, Kolhapur