Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B.Sc. I

Semester - I

Subject: Mathematics

Course Title: Calculus

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Differentiation	Successive Differentiation Higher order derivatives: notations. Calculation of nth derivative: Standard results
04	00	04		
Month: August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Differentiation	Determination of nth derivative of rational functions: Examples. The nth derivative of product of the powers of sine and cosines: Examples.
04	00	04		
Month : September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Differentiation	Leibnitz's Theorem. The nth derivative of product of two functions. Examples on Leibnitz's Theorem.
03	00	03		
Month : October			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Differentiation	Partial differentiation Introduction to functions of two and more variables Partial derivative: first order and higher order – examples. Geometrical interpretation of partial derivatives of first order.
04	00	04		

Thorat

Name and Signature of Teacher

(Mr. S. P. Thorat)

VIVEKANAND COLLEGE KOLHAPUR * (Empowered Autonomous) * ESTD JUNE 1964

Thorat

(Prof. S. P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B.Sc. II (Major) Semester - III

Subject: Mathematics Course Title: Integral Calculus

Month : July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Beta and Gamma Functions	Definition of Gamma function, Basic Properties of Gamma function Examples on Gamma functions
04	00	04		
Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Beta and Gamma Functions	Definition of Beta function, Basic Properties of Beta function, Examples on Beta functions Relation between Beta and Gamma function
04	00	04		
Month : September			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Multiple Integral	Double Integration: Method of evaluation and related examples, (Cartesian, Polar Form) Change of order of integration
04	00	04		
Month : October			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Multiple Integral	Change of variable, Examples of triple integral.
04	00	04		

Name and Signature of Teacher

(Mr. S. P. Thorat)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Prof. S. P Thorat

Programme - B.Sc. II (Minor) Semester - III

Subject: Mathematics Course Title: Calculus of Integrable function

Month : July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Beta and Gamma Functions	Definition of Gamma function, Basic Properties of Gamma function Examples on Gamma functions
04	00	04		
Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Beta and Gamma Functions	Definition of Beta function, Basic Properties of Beta function, Examples on Beta functions Relation between Beta and Gamma function
04	00	04		
Month : September			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Multiple Integral	Double Integration: Method of evaluation and related examples, (Cartesian, Polar Form) Change of order of integration
04	00	04		
Month : October			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Multiple Integral	Change of variable, Examples of triple integral.
04	00	04		

Thorat

Name and Signature of Teacher

(Mr. S. P. Thorat)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of Teacher: Mr. S. P. Thorat

Program: B.Sc. II Semester: III

Subject: Mathematics Course Title: DSC- Mathematics Lab 3

Month: August			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Examples on vector	1) Examples on vector identities. 2)Examples on Line, Surface, and Volume Integral. 3)Examples on Green's Lemma and Gauss Divergence Theorem
00	11	11		
Month: September			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Gamma and Beta Functions	1)Examples on Stoke's Theorem. 2)Examples of Gamma Functions. 3)Examples of Beta Functions.
00	15	15		
Month: October			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Integration	1)Examples on relation between Gamma and Beta Functions. 2)Examples of D.U.I.S. 3)Examples on Double Integral
00	13	13		
Month: November			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Fourier Series	1)Examples on Triple Integral 2)Examples of Fourier Series 3)Examples on Fourier Series of Sine, Cosine Expansion
00	15	15		

Name and Signature of Teacher
(Mr. S. P. Thorat)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. III

Semester - V

Subject: Mathematics

Course Title: Partial Differential Equation

Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Partial Differential Equation	1.Defination, 2. Derivation of a partial order differential equation by the elimination of constants 3.Derivation of partial differential equation by the elimination of arbitrary functions
07	00	07		
Month: September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Non-Linear Partial Differential Equations	1.The integrals of the non-linear equation , the complete and particular integrals 2.the singular integral, the general integral, the integral of the linear equation, equation equivalent to the linear equation 3. lagrange's solution of the linear equation 4. verification of lagrange's theorem
10	00	10		
Month : October			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	General Solution of partial differential equation	1.The linear equation involving more than two independent variables 2. Geometrical meaning of the linear partial differential equation 3.Special methods of solution applicable to certain standard forms 4.General methods of solution
11	00	11		
Month : November			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Higher order partial differential equation	1.Partial differential equations 2. Complementary Functions 3.The non-homogeneous equation with constant coefficient 4.Transformation of Equation
11	00	11		

Name and Signature of Teacher

(Mr. S. P. Thorat)

VIVEKANAND COLLEGE KOLHAPUR * ESTD JUNE 1964 * (Empowered Autonomous)

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. V.B. Patil

Programme - B.Sc. I

Semester - I

Subject: Mathematics

Course Title: OE-I : Foundation of Mathematics

Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Set Theory	Examples on Venn Diagrams and Operations on Sets Examples on cartesian product of set Examples on Types of relations
00	12	12		
Month: August			**Module/Unit:**	**Sub-units planned**
Lectures	Practicals	Total	Equivalence class, Relations	Examples on equivalence relation Examples on equivalence class Examples on function sand their types
00	12	12		
Month : September			**Module/Unit:**	**Sub-units planned**
Lectures	Practicals	Total	Line theory and Geogebra	Examples on mid-point , distance, section formula Examples on standard graphs on Geogebra in cartesian co-ordinate system
00	08	08		
Month : October			**Module/Unit:**	**Sub-units planned**
Lectures	Practicals	Total	Absolute value	Examples on standard graphs on Geogebra in polar co-ordinate system Examples on absolute value
00	09	09		

Name and Signature of Teacher

Ms. V. B. Patil

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of Teacher: Ms. V.B. Patil

Program: B.Sc. III Semester: V

Subject: Mathematics Course 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) Solution of LPP using Simplex Method
00	15	15		
Month: September			Module/Unit I/II	Subunits Planed
Lectures	Practical	Total	Introduction to LPP and Transportation and Assignment-I	3) Solution of LPP using Big – M method 4) Transportation Problems (North west corner rule)
00	16	16		
Month: October			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Transportation and Assignment-II	5) Transportation Problems (Lowest cost Method) 6) Transportation Problems (Vogel Approximation Method)
00	15	15		
Month: November			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Transportation and Assignment-III	7) Transportation Problems (Test For Optimality MODI Method) 8) Assignment Problems (Hungarian Method)
00	17	17		

Name and Signature of Teacher

Ms. V.B. Patil

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE, KOLHAPUR
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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. V. B. Patil

Programme - B. Sc. III

Semester - V

Subject: Mathematics

Course Title: Numerical Methods

Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Numerical Interpolation(for unequal interval)	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	00	12		
Month: September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Numerical Interpolation (for equal interval)	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	00	12		
Month : October			Module/Unit: III	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	00	12		
Month : November			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Solution of first order Ordinary Differential Equations	1. Euler's Method, Examples, 2. Second order Runge-Kutta method (formula only). Examples 3. Fourth order Runge-Kutta method (formula only), examples
12	00	12		

Vaishali Patil

Name and Signature of Teacher

Ms. V.B. Patil

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B.Sc. I

Semester - I

Subject: Mathematics

Course Title: Basic Algebra

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Algebra of complex numbers	Sums and Products, Moduli, Polar form, Geometrical representation of Complex Numbers, Exponential form, arguments of Products and Quotients.
04	00	04		
Month: August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Algebra of complex numbers	De-Moivre's Theorem and examples Applications of De-Moivre's Theorem: nth roots of unity.
04	00	04		
Month : September			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Algebra of complex numbers	Expansion of $cos\ n\theta$, $sin\ n\theta$ Circular functions and hyperbolic functions
03	00	03		
Month : October			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Algebra of complex numbers	Relations between circular and hyperbolic functions. Inverse circular and hyperbolic functions.
04	00	04		

G.B. Kolhe

Name and Signature of Teacher

(Mr. Gaurav B. Kolhe)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

S.P. Thorat

(Prof. S. P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B.Sc. II (Major) Semester - III

Subject: Mathematics Course Title: Integral Calculus

Month : July			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Differentiation under Integral Sign and error function	Case of constant limits of integration, Problem involving one parameter, problems involving two parameters,
04	00	04		
Month : August			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Differentiation under Integral Sign and error function	Leibnitz rule for differential under integral sign and examples Definition of error function, complementary error function. basic properties of error function
04	00	04		
Month : September			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Fourier Series	Periodic functions, Even and Odd functions Fourier Series Expansion of elementary functions (Over the different ranges $[-\pi, \pi]$, $[0,2\pi]$, $[-c, c]$, $[0,2c]$)
04	00	04		
Month : October			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Fourier Series	Fourier Sine and Cosine series expansion Half Range series expansion
03	00	03		

G.B.Kolhe

Name and Signature of Teacher

(Mr. Gaurav B. Kolhe)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of Teacher: Mr. G. B. Kolhe

Program: B.Sc. II Semester: III

Subject: Mathematics Course Title: DSC- Mathematics Lab 3

Month: August			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Examples of Jacobian	1) Examples of Jacobian with 2 variables. 2) Examples of Jacobian with 3 variables. 3) Examples of Jacobian with chain rule.
00	15	15		
Month: September			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Functions	1) Examples of Taylor's and Maclaurin's Theorem 2) Examples on Maxima and Minima of Functions 2 variables
00	09	09		
Month: October			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Lagrange's Method of Undetermined Multiplier	1) Examples of Lagrange's Method of Undetermined Multipliers
00	05	05		
Month: November			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Gradint, Divergence, Curl	1) Examples of Gradient, Divergence, and Curl of a vector 2) Examples of Solenoidal, and irrotational vectors field.
00	09	09		

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

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

S.P. Thorat
(Prof. S.P. Thorat)
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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. III

Semester - V

Subject: Mathematics

Course Title: Modern Algebra

Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Groups	1.Binary Compositions, Permutations (Definition and examples) , Cyclic Permutations , Cycles of a Permutation , Disjoint Permutations Even permutation, Odd permutation, 2. Some Results From Number Theory(statement only) , The Greatest Common Divisor(definition only), Some properties without proof 3.Groups - Abelian groups(definition and examples), Subgroups , Centre of 4.group, Normaliser of subgroup, Cosets, Cyclic Groups, Euler's theorem and Fermat's theorem
11	00	11		
Month: September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Normal Subgroups, Homomorphism	1.Normal Subgroups, Quotient Groups 2. Homomorphisms, Isomorphisms 3. Kernel , 4. Fundamental theorems of homomorphism 5. conjugate elements
08	00	08		
Month : October			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Rings	1.Rings, zero divisors, Integral domains 2. Field, Subrings, Characteristic of a Ring , Idempotent element 3. nilpotent element, Product of Rings 4. Ideals, Sum of Ideals, Product of Ideals , Simple rings
11	00	11		
Month : November			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Solution of first order Ordinary Differential Equations	1.Quotient Rings, Homomorphisms, kernel, 2. fundamental theorems of ring homomorphism 3.Embedding of Rings(statements) 4. Maximal Ideal, Prime Ideals 1.
09	00	09		

G.B.Kolhe

Name and Signature of Teacher

(Mr. Gaurav B. kolhe)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

S.P.Thorat

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Miss. P.P. Kulkarni

Programme - B.Sc. I

Semester - I

Subject: Mathematics

Course Title: Basic Algebra

Month: July			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Matrices	Introduction Definitions of Hermitian and Skew Hermitian matrices. Properties of Hermitian and Skew Hermitian matrices.
04	00	04		
Month: August			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Matrices	Rank of a Matrix, Row-echelon form and reduced row echelon form, normal form. System of linear homogeneous and non-homogeneous equations. Condition for consistency and examples.
04	00	04		
Month : September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Matrices	Nature of the general solution and examples. Gaussian elimination and Gauss Jordon method and examples. (Using row-echelon form and reduced row echelon form).
04	00	04		
Month : October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Matrices	Characteristic equation, eigen values and eigen vectors of a matrix and examples Cayley Hamilton theorem and examples.
03	00	03		

Name and Signature of Teacher

Ms. P. P. Kulkarni

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

(Prof. S. P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. P. P. Kulkarni

Programme - B.Sc. I

Semester - I

Subject: Mathematics

Course Title: DSC Mathematics Lab-I

Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	De-Moivre theorem	Examples on De-Moivre's Theorem and n^{th} roots of unity Solution of system of linear homogeneous equations.
00	12	12		
Month: August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Matrices	Solution of system of linear non-homogeneous equations. Eigen values and Eigen vectors of matrix
00	09	09		
Month : September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	System of linear equations	Cayley-Hamilton Theorem (Verification and finding inverse of matrix)
00	12	12		
Month : October			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Differentiation	Examples of n^{th} derivative and Leibnitz's Theorem. Examples on partial differentiation
00	09	09		

Name and Signature of Teacher

Ms. P. P. Kulkarni

VIVEKANAND COLLEGE, KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. P.P. Kulkarni

Programme - B.Sc. II (Major) Semester - III

Subject: Mathematics Course Title: Multivariable Calculus

Month : July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Jacobians	Definition of Jacobian Properties of Jacobians
04	00	04		
Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Jacobians	Examples on Jacobians
03	00	03		
Month : September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Applications of Partial Differentiation	Taylor's and Maclaurin's theorem for functions of two variables (Statement Only) Maxima and minima of functions of two variables
04	00	04		
Month : October			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Applications of Partial Differentiation	Lagrange's method of undetermined multipliers
04	00	04		

Name and Signature of Teacher

[Ms. P. P. Kulkarni]

VIVEKANAND COLLEGE KOLHAPUR * (Empowered Autonomous) * ESTD JUNE 1964

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. P.P. Kulkarni

Programme - B.Sc. II (Minor) Semester - III

Subject: Mathematics Course Title: Calculus of Multiple variables

Month : July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Jacobians	Definition of Jacobian Properties of Jacobians
04	00	04		
Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Jacobians	Examples on Jacobians
03	00	03		
Month : September			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Applications of Partial Differentiation	Taylor's and Maclaurin's theorem for functions of two variables (Statement Only) Maxima and minima of functions of two variables
04	00	04		
Month : October			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Applications of Partial Differentiation	Lagrange's method of undetermined multipliers
04	00	04		

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Name and Signature of Teacher

[Ms. P.P. Kulkarni]

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

Thorat

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. P.P. Kulkarni

Programme - B.Sc. III

Semester - V

Subject: Mathematics

Course Title: Real Analysis

Month: August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Sequence of real numbers	1. Upper bound and Lower bound 2. Sequence and subsequence 3. Limit of sequence 4. Convergent and divergent sequence 5. Limit superior and limit inferior
12	00	12		
Month: September			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Series of real numbers	1. Series with non-negative terms 2. Alternating series 3. Absolute convergence 4. Test of absolute convergence
11	00	11		
Month : October			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Riemann Integral	1. The Riemann integral and properties 2. Riemann integrable functions 3. The squeeze Theorem, Classes of Riemann integrable functions 4. The fundamental Theorem.
10	00	10		
Month : November			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Improper Integral	1. Improper integral of first kind, Comparison test, - test for Convergence 2. convergence, Integral test for convergence of series Improper integral of second kind
09	00	09		

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Name and Signature of Teacher

[Ms. P.P. Kulkarni]

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B.Com. I

Semester - I

Subject: Mathematics

Course Title: OEC02MAT11 Business Mathematics -I

<table>
<tr><td colspan="3">Month: July</td><td>Module/Unit: I</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Set Theory:</td><td rowspan="2">Definition Of Set, Types of Set, Operations on Set, Relations And types of relations, Functions and Types of Functions and its Examples Venn diagrams, Problems of solutions using Venn diagram, Domain and range of functions</td></tr>
<tr><td>14</td><td>-</td><td>14</td></tr>
<tr><td colspan="3">Month: August</td><td>Module/Unit: II</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Introduction of A.P., G.P.,</td><td rowspan="2">Introduction of A.P., G.P., Ratio, Percentage and Interests:
Definitions of A.P. and G.P., Formulae for nth term and sum to n term of A.P. and G.P., Simple examples. Different types of interest rates, Introduction to ratio and percentage, Concept of proportion, Applications to division into proportional part</td></tr>
<tr><td>16</td><td>-</td><td>16</td></tr>
<tr><td colspan="3">Month : September</td><td>Module/Unit: III</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Matrix</td><td rowspan="2">Definition of a matrix, types of matrices, Algebra of matrices, Adjoint of a matrix, Finding inverse of a matrix by using adjoint matrix. Properties of determinants (without proofs), calculation of values of determinants upto third order, Solutions of system of linear equations by Crammer's Rule.</td></tr>
<tr><td>18</td><td>-</td><td>18</td></tr>
<tr><td colspan="3">Month : October</td><td>Module/Unit: IV</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Linear Programming Problem</td><td rowspan="2">Definition, Formulation of given problem in LPP, Types of solutions, Solution by Graphical Method, Solution by Simplex Method</td></tr>
<tr><td>17</td><td>-</td><td>17</td></tr>
</table>

(Ms. A.M. Sathe)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

(Prof. S.P. Thorat)

HEAD

DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B.Sc. II (Major) Semester - III

Subject: Mathematics Course Title: Integral Calculus

Month : July			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Vector Differential Calculus	General rules of vector differentiation Scalar and vector fields
04	00	04		
Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Vector Differential Calculus	Gradient, divergence and curl Solenoidal and irrotational vector fields Vector identities
04	00	04		
Month : September			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Vector Integral Calculus	Vector Integration Line integral, surface integral and volume integral
04	00	04		
Month : October			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Vector Integral Calculus	Green's lemma, Gauss divergence theorem and Stokes Theorem (Without proof) Examples
04	00	04		

(Ms. A.M. Sathe)

Name and Signature of Teacher

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VIVEKANAND COLLEGE, KOLHAPUR

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B.Sc. II (Minor) Semester - III

Subject: Mathematics Course Title: Calculus of Multiple variables

Month : July			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Vector Differential Calculus	General rules of vector differentiation Scalar and vector fields
04	00	04		
Month : August			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Vector Differential Calculus	Gradient, divergence and curl Solenoidal and irrotational vector fields Vector identities
04	00	04		
Month : September			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Vector Integral Calculus	Vector Integration Line integral, surface integral and volume integral
04	00	04		
Month : October			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Vector Integral Calculus	Green's lemma, Gauss divergence theorem and Stokes Theorem (Without proof) Examples
04	00	04		

(Ms. A.M. Sathe)

Name and Signature of Teacher

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VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of Teacher: Ms. A.M. Sathe

Program: B.Sc. II Semester: III

Subject: Mathematics Course Title: MIN – Mathematics Lab 3

Month: September			Module/Unit	Subunits Planed
Lectures	Practical	Total	Gradint, Divergence, Curl	1. Examples of Gradient, Divergent and Curl of a vector 2. Examples of Solenoidal and irrotational vector field 3. Examples on line, surface and volume integral
00	12	12		

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Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of Teacher: Ms. A.M Sathe

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	Numerical Interpolation(for equal interval)	1) Newton's forward interpolation
00	09	09		
Month: September			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Numerical Interpolation(for equal interval)	2) Newton's Backward interpolation
00	07	07		
Month: October			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Numerical Interpolation(for unequal interval)	1) Lagrange's interpolation
00	08	08		
Month: November			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Numerical Interpolation(for unequal interval)	2) Newton's Divided difference interpolation
00	05	05		

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. S. J. Koshti

Programme - B.Sc. I

Semester - I

Subject: Mathematics

Course Title: Calculus

<table>
<tr><td colspan="3">Month: July</td><td>Module/Unit: II</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Mean Value Theorems and Indeterminate forms</td><td rowspan="2">Mean Value Theorems
Rolle's Mean Value Theorem, Geometrical interpretation.</td></tr>
<tr><td>04</td><td>00</td><td>04</td></tr>
<tr><td colspan="3">Month: August</td><td>Module/Unit: II</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Mean Value Theorems and Indeterminate forms</td><td rowspan="2">Lagrange's Mean Value Theorem, Geometrical interpretation.
Meaning of sign of derivative</td></tr>
<tr><td>04</td><td>00</td><td>04</td></tr>
<tr><td colspan="3">Month : September</td><td>Module/Unit: II</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Mean Value Theorems and Indeterminate forms</td><td rowspan="2">Cauchy's Mean Value Theorem. Examples
Indeterminate forms
Indeterminate forms: L' Hôpital rule for $\frac{0}{0}$ and $\frac{\infty}{\infty}$ form (Statement only).</td></tr>
<tr><td>03</td><td>00</td><td>03</td></tr>
<tr><td colspan="3">Month : October</td><td>Module/Unit: II</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Mean Value Theorems and Indeterminate forms</td><td rowspan="2">The indeterminate forms $0 \times \infty$, $\infty - \infty$, 0^0, 1^∞, ∞^0
Expansion of functions
Maclaurin's theorem (statement only): Examples.
Taylor's theorem (statement only): Examples.</td></tr>
<tr><td>04</td><td>00</td><td>04</td></tr>
</table>

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. S. J. Koshti

Programme - B.Sc. I

Semester - I

Subject: Mathematics

Course Title: DSC Mathematics Lab-I

<table>
<tr><td colspan="3">Month: July</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Mean Value Theorems</td><td rowspan="2">Examples on Lagrange's Mean Value Theorem</td></tr>
<tr><td>00</td><td>04</td><td>04</td></tr>
<tr><td colspan="3">Month: August</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Mean Value Theorems</td><td rowspan="2">Cauchy's Mean Value Theorems</td></tr>
<tr><td>00</td><td>04</td><td>04</td></tr>
<tr><td colspan="3">Month : September</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Indeterminate forms</td><td rowspan="2">Examples on Indeterminant form</td></tr>
<tr><td>00</td><td>04</td><td>04</td></tr>
<tr><td colspan="3">Month : October</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Indeterminate forms</td><td rowspan="2">Examples on expansion of functions</td></tr>
<tr><td>00</td><td>03</td><td>03</td></tr>
</table>

Koshti

Name and Signature of Teacher

(Ms. S. J. Koshti)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of Teacher: Ms. S. J. Koshti

Program: B.Sc. II Semester: III

Subject: Mathematics Course Title: Introduction to Python

Month: August			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Introduction to Python	1. Introduction to Python 2. Expression and operators 3.Conditional statements
00	15	15		
Month: September			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Loop and Modules	1.Looping and control statements 2.Functions 3.Modules and packages in Python
00	16	16		
Month: October			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Numerical Integration	1.Operation on sets 2.Numerical Integration (Trapezoidal, Simpson's 1/3 rd & 3/8 th)
00	17	17		
Month: November			Module/Unit :	Subunits Planed
Lectures	Practical	Total	Roots finding Methods	1.Roots of equations (Bisection, Newton-Raphson Method) 2.Initial value problem (Euler, Euler Modified, RK2, RK4)
00	15	15		

Koshti

Name and Signature of Teacher

(Ms. S. J. Koshti

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of Teacher: Ms. S. J. Koshti

Program: B.Sc. II Semester: III

Subject: Mathematics Course Title: MIN – Mathematics Lab 3

Month: August			Module/Unit ..	Subunits Planed
Lectures	Practical	Total	Jacobian, Taylor And Maclaurin's Theorem	1. Example on Jacobian 2. Examples of Taylor's And Maclaurin's Multipliers 3. Example of Taylor's Method of undetermined multipliers
00	08	08		
Month: October			Module/Unit ..	Subunits Planed
Lectures	Practical	Total	Gamma and Beta Function	1. Examples on Stoke's Theorem 2. Examples on Gamma Function 3. Examples on Beta function
00	13	13		
Month: November			Module/Unit ..	Subunits Planed
Lectures	Practical	Total	Examples on D.I.U.S	1. Examples on D.I.U.S 2. Examples on Double integral 3. Examples on Fourier series
00	16	16		

Koshti

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[Ms. S. J. Koshti]

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Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of Teacher: Ms. S. J. Koshti

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	Numerical Differentiation	1) Newton's forward differentiation for tabular value
00	10	10		
Month: September			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Numerical Differentiation	2) Newton's forward differentiation for Non -tabular value
00	09	09		
Month: October			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Numerical Differentiation	3) Newton's backward differentiation for tabular value
00	10	10		
Month: November			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Numerical Differentiation	4) Newton's backward differentiation for Non -tabular value
00	09	09		

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Name and Signature of Teacher

[Ms. S. J. Koshti]

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
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Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of Teacher: Ms. S. J. Koshti

Program: B.Sc. III Semester: V

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

Month:			Module/Unit I	Subunits Planed
Lectures	Practical	Total	Introduction	1) Introduction to Python
00	16	16		
Month: October			Module/Unit II	Subunits Planed
Lectures	Practical	Total	Conditional statement	2) Expression and operators 3) Conditional statement
00	15	15		
Month: November			Module/Unit III	Subunits Planed
Lectures	Practical	Total	Conditional statement	4) Looping and control statement
00	17	17		
Month: December			Module/Unit IV	Subunits Planed
Lectures	Practical	Total	Functions	5) Functions
00	18	18		

Koshti

Name and Signature of Teacher

[Ms. S.J. Koshti]

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DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

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

Programme - M.Sc.-I

Semester-I

Subject: Mathematics

Course Title: Research Methodology

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Mathematical Writing	1. What is a theorem? , Proofs. The role of examples Words versus symbols. 2. Displaying Equations, Parallelism, Dos and Don'ts of Mathematical writing. 3. Writing a paper : Audience, Organization and structure, Author list, Abstract, Key words.
16	00	16		
Month: August			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Writing a Paper	1. The introduction, Review of Literature, Computational experiments, Citations, Conclusions 2. Acknowledgements, Appendix, Reference list, specific and deprecated 3. Revising Draft: How to revise , examples of prose, examples involving equations. 4. a revised proof, A draft Article for improvement
17	00	17		
Month: September			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Publishing a Paper	1. Choosing a Journal, Submitting a manuscript, The refereeing process , How to referee , 2. The Role of copy Editor, Checking the proofs Copyright issues 3. SIAM Journal Article : A case study 4. Writing and Defending a thesis : The purpose of a thesis, content, presentation, the thesis defence.
18	00	18		
Month: October			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Quality indices of research publication	1. Impact factor, H-index, science citation index. 2. Using web for literature review: Google scholar, Scopus, MathSciNet 3. Latex and Beaner for paper typing and presentations: Latex-typesetting , mathematics, typesetting theorems. Making presentations with LATEX-Beamer
16	00	16		

Name And Sign of Faculty

(Prof. S. P. Thorat)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Mr. A. A. Patil

Programme: M.Sc. I | Semester: I

Subject: Mathematics | Course Title: Measure and Integration

Month: July			Module/Unit:	Sub-units planned
Lectures	Practical	Total	1. Lebesgue Outer Measure	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) non-measurable set.
18	00	18		
Month: August			**Module/Unit:**	**Sub-units 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.
15	00	15		
Month: September			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	3. 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 BoundedVariations:Jordan's Theorem
17	00	17		
Month: October			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	4. Absolutely Continuous Functions	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.
15	00	15		

Name And Sign of Faculty

(Mr. A. A. Patil)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

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

Programme: M.Sc. I | Semester: I

Subject: Mathematics | Course Title: Ordinary Differential Equations

Month: July			Module/Unit:	Sub-units planned
Lectures	Practical	Total	1. Second order homogeneous Equations	1. Second order homogeneous Equations 2. Linear dependence & dependence 3. Non-homogeneous equations of order two 4. Homogeneous equations of order n
17	00	17		
Month: August			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	2. 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
15	00	15		
Month: September			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	3. The legendre 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
17	00	17		
Month: October			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	4. The Bessel equation	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
16	00	16		

Name And Sign of Faculty

(Ms. Ankita M. Sathe)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

(Prof. S. P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. A. D. Patil
Programme: M. Sc. I
Subject: Mathematics

Semester: I
Course Title: Modern Algebra

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practical	Total	Simple Groups	1)Permutation group, Group of symmetry, Dihedral group, Commutator subgroups Simple groups, simplicity of An , 2) Normal and subnormal series, Jordan-Holder theorem 3) Solvable groups, Nilpotent group, isomorphism theorems (Statement only) 4) Zassenhaus Lemma, Schreier refinement theorem.
15	00	15		
Month: August			Module/Unit: II	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: September			Module/Unit: III	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] 3) Unique Factorization domain, principal ideal domain 4)Gauss lemma, Euclidean Domain
15	00	15		
Month: October			Module/Unit: IV	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.
15	00	15		

(Ms. A. D. Patil)
Name And Sign of Faculty

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE, KOLHAPUR
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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. S. J. Koshti

Programme: M.Sc. I | Semester: I

Subject: Mathematics | Course Title: Numerical Analysis-I

Month: August			Module/Unit:	Sub-units planned
Lectures	Practical	Total	1. Iterative solutions	1.Iterative solutions of Transcendental & polynomial equations: Bisection method, 2. Iteration methods based on First degree equation 3.Secant method, Regula Falsi method Newton Raphson
15	00	15		
Month: September			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	2. linear System of algebraic equations and Eigenvalue problems	1.Linear System of algebraic equations and Eigenvalue problems: Iteration methods (Jacobi iteration method, Gauss seidel iteration method) 2.Convergence analysis, Matrix factorization methods (Doo little reduction, Crout reduction), 3.Eigen values and eigenvectors, Gerschgorin theorem, Brauer theorem, Jacobi method for symmetric matrices 4. Power method.
18	00	18		

Miss. Shweta J. Koshti

Name And Sign of Faculty

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. S. J. Koshti
Programme: M. Sc. I
Semester: I
Subject: Mathematics
Course Title: Operational Research

Month: July			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Convex Set and LPP:	1)Convex set and their properties. 2)Lines, hyperplanes and polyhedral convex set and its theorems. 3)Convex combination of vectors, convex hull. Simplex and convex function. 2) General form of linear programming and Matrix form of linear programming. 3)Definition of standard LPP and theorems of it.
15	00	15		
Month: August			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	Simplex Method:	1) Computational procedure of simplex method. Problem of degeneracy, revised simplex method in standard form- I 2) Duality in linear programming and duality theorems. 3)Integer linear programming: Gomory's cutting plane method, Branch and Bound method.
17	00	17		
Month: September			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	Dynamic Programming:	1) Bellman's Principle of Optimality 2) Application of Dynamic Programming in production 3) Inventory control and linear programming.
15	00	15		
Month: October			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	Non linear Programming:	1) Unconstrained problems of maximum and minimum 2) Lagrangian method Kuhn Tucker necessary and sufficient conditions 3) Wolfe's method and Beale's method
16	00	16		

Koshti
Miss. Shwela J. Koshti
Name And Sign of Faculty

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

Thorat
(Prof. S. P. Thorat)
HEAD
DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Mr. A. A. Patil

Programme: M. Sc. II | Semester: III

Subject: Mathematics | Course Title: Complex Analysis

Month: July			Module/Unit:	Sub-units planned
Lectures	Practical	Total	1. Analytic Functions	1.1 Power series, radius of convergence, 1.2 Analytic functions, zeros of an analytic function 1.3 Cauchy-Riemann equations Harmonic functions, 1.4 Mobius transformations
18	00	18		
Month: August			Module/Unit:	Sub-units planned
Lectures	Practical	Total	2. Cauchy Integral	2.1. Power series representation of analytic function. 2.2. Liouville's theorem, Fundamental theorem of algebra, 2.3. Maximum modulus theorem, the index of closed curve, 2.4. Cauchy's theorem and integral formula, Morera's theorem.
15	00	15		
Month: September			Module/Unit:	Sub-units planned
Lectures	Practical	Total	3. Singularities	3.1 Counting zero's, The open mapping theorem, Goursat's Theorem. 3.2 Classification of singularities, Laurent series development. 3.3 Casorati- Weierstrass theorem.
17	00	17		
Month: October			Module/Unit:	Sub-units planned
Lectures	Practical	Total	4. Residues	4.1 The argument principle, Rouche's theorem, the maximum principle. Schwar's lemma 4.2 Residues, residues and its applications to characterize conformal maps.
16	00	16		

Patil

Name And Sign of Faculty

(Mr. A. A. Patil)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

(Prof. S. P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

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

Programme: M. Sc. II | Semester: III

Subject: Mathematics | Course Title: Classical Mechanics

Month: July			Module/Unit:	Sub-units planned
Lectures	Practical	Total	1 Mechanics of a particle,	1.1 Mechanics of a particle, Mechanics of a system of particles, conservation theorems. 1.2.Generalised coordinates, D' Alembert's Principle, Lagrange's equations of motion, 1.3. Kinetic energy as a homogeneous function generalised velocities, Non-conservation of total energy due to the existence of non-conservative forces. 1.4.Cyclic co-ordinates and generalised momentum, conservation theorems
18	00	18		
Month: August			Module/Unit:	Sub-units planned
Lectures	Practical	Total	2. Euler-Lagrange's equations	2.1.Functionals, basic lemma in calculus of variations, Euler-Lagrange's equations, first integral Euler- Lagrange's equations, the case of several dependent variables 2.2.Undetermined conditions, Geodesics in a plane and space, the minimum surface of revolution, the problem Brachistochrone 2.3. Isoperimetric problems, problem of maximum enclosed area. Hamilton Principle, Derivation of Hamilton's principle from D'Alembert's principle, Lagrange's equation of motion from Hamilton's principle. 2.4.Lagrange's equations of motion for non-conserva systems (Method of Lagrange's undetermined multipliers)
15	00	15		
Month: September			Module/Unit:	Sub-units planned
Lectures	Practical	Total	3. Hamiltonian function	3.1. Hamiltonian function, Hamilton's canonical equations of motion, Derivation of Hamilt equations from variational principle 3.2. Physical significance of Hamiltonian, the principle of 1 action 3.3. cyclic co-ordinates and Routh's procedure. Orthogonal transformations 3.4. Properties transformation matrix, infinitesimal rotations
17	00	17		
Month: October			Module/Unit:	Sub-units planned
Lectures	Practical	Total	4. The Kinematics of rigid body motion	4.1.The Kinematics of rigid body motion: The independent co-ordinates of a rigid body, the Eule angles 4.2. Euler's theorem on motion of rigid body, Angular momentum and kinetic energy rigid body with one point fixed 4.3. The inertia tensor and moment of inertia, Euler's equations motion, Cayley- Klein parameters 4.4. Matrix of transformation in Cayley- Klein parameter Relations between Eulerian angles and Cayley- Klein parameters
16	00	16		

G. B. Kolhe

Name And Sign of Faculty

(Mr. Kolhe Gaurav Basweshwer)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE, KOLHAPUR

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. P. P. Kulkarni

Programme: M. Sc. II | Semester: III

Subject: Mathematics | Course Title: Functional Analysis

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practical	Total	Normed Linear Spaces	1.1 Normed linear spaces, Banach spaces, Quotient spaces, Continuous linear transformations, Equivalent norms. 1.2 Finite dimensional normed spaces and properties, Conjugate space and separability. 1.3 The Hahn-Banach theorem and its Consequences.
16	00	16		
Month: August			Module/Unit: II	Sub-units planned
Lectures	Practical	Total	Second conjugate space	2.1 Second conjugate space, the natural embedding of the normed linear space in its second conjugate space. 2.2 Reflexivity of normed spaces, Weak * topology on the conjugate space. 2.3 The open mapping theorem, Projection on Banach space, the closed graph theorem. 2.4 The conjugate of an operator, the uniform boundedness principle.
15	00	15		
Month: September			Module/Unit: III	Sub-units planned
Lectures	Practical	Total	Hilbert spaces	3.1 Hilbert spaces: examples and elementary properties, Orthogonal complements. 3.2 The projection theorem, Orthogonal sets. 3.3 The Bessel's inequality, Fourier expansion and Parseval's equation, separable Hilbert spaces. 3.4 The conjugate of Hilbert space, Riesz's theorem. 3.5 The adjoint of an operator.
16	00	16		
Month: October			Module/Unit: IV	Sub-units planned
Lectures	Practical	Total	Self adjoint operators	4.1 Self adjoint operators, Normal and Unitary operators, Projections. 4.2 Eigen values and eigenvectors of an operator on a Hilbert space 4.3 The determinants and spectrum of an operator 4.4 The spectral theorem on a finite dimensional Hilbert space.
16	00	16		

Pkulkarni
(Ms. P. P. Kulkarni)
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VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE, KOLHAPUR
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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. A. D. Patil

Programme: M. Sc. II Semester: III

Subject: Mathematics Course Title: Advanced Discrete Mathematics

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practical	Total	Graph Theory	1.1 Graph Theory: Definition, examples and properties, Simple graph 1.2 Graph isomorphism, Bipartite graphs, Complete Bipartite graph, regular graph, sub-graphs spanning sub-graph, Edge deleted sub-graph, Vertex deleted sub-graph 1.3 Union and intersection of two graphs, complements of a graph, self complementary graph 1.4 paths and cycles in a graph, Eccentricity, radius and diameter of a connected graph 1.5 Peterson graph, Wheel graph. Isomorphism of Graphs. First theorem of graph theory
15	00	15		
Month: August			**Module/Unit: II**	**Sub-units planned**
Lectures	Practical	Total	Adjacency matrix	2.1 The Matrix representation of a graph, Adjacency matrix and Incidence matrix of a Graph 2.2 Definition and simple properties of a tree, bridges, spanning trees 2.3 Inclusion exclusion principle. 2.4 Simple examples on Inclusion exclusion principle Pigeonhole principle 2.5 Examples on Pigeonhole principle
15	00	15		

(Ms. A. D. Patil)

Name And Sign of Faculty

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE, KOLHAPUR

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. A. D. Patil

Programme: M. Sc. II | Semester: III

Subject: Mathematics | Course Title: Lattice Theory

Month: July			Module/Unit: I	Sub-units planned
Lectures	Practical	Total	Basic concepts	1.1 Posets, Definition and examples of posets. 1.2 Two definitions of lattices and their equivalence, examples of lattices. 1.3 Description of Lattices, some algebraic concepts. 1.4 Duality principle, Specialelements. 1.5 Homomorphism, Isomorphism and isotone maps.
18	00	18		
Month: August			**Module/Unit: II**	**Sub-units planned**
Lectures	Practical	Total	Special types of Lattices	2.1 Distributive lattices – Properties and characterizations. 2.2 Modular lattices – Properties and characterizations. 2.3 Congruence relations. 2.4 Boolean algebras – Properties and characterizations.
15	00	15		
Month: September			**Module/Unit: III**	**Sub-units planned**
Lectures	Practical	Total	Ideal theory	3.1 Ideals and filters in lattices. 3.2 Lattice of all ideals I(L). 3.3 Properties and characterizations of I(L). 3.4 Stone's theorem and its consequences.
17	00	17		
Month: October			**Module/Unit: IV**	**Sub-units planned**
Lectures	Practical	Total	Stone algebra	4.1 Pseudo complemented lattices. 4.2 S(L) and D(L) – special subsets of pseudo complemented lattices. 4.3 Distributive pseudo complemented lattice. 4.4 Stone lattices – properties and characterizations
16	00	16		

(Ms. A. D. Patil)
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VIVEKANAND COLLEGE KOLHAPUR * (Empowered Autonomous) * ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. I Semester - II

Subject: Mathematics Course Title: Differential Equations - I (DSC03MAT21)

Month: December			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Linear differential equation with constant coefficient	1.1 Introduction. 1.2 Auxiliary equation, Complementary function.
05	00	05		
Month: January			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Linear differential equation with constant coefficient	2.1 Types of complementary functions. 2.2 Distinct real roots, repeated real roots, complex roots, repeated complex roots.
04	00	04		
Month: February			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Linear differential equation with constant coefficient	3.1 Particular integrals. 3.2 Particular integrals of the functions: e^{ax}, $sinax, cosax$, x^m, $e^{ax}.V$ and $x.V$.
04	00	04		
Month: March			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Linear differential equation with constant coefficient	4.1 Applications to Electrical circuits. 4.2 Examples.
03	00	03		

(Mr. S. P. Thorat)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR * (Empowered Autonomous) * ESTD JUNE 1964

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. II (Major) Semester - IV

Subject: Mathematics Course Title: Integral Transform(DSC03MAT42)

Month: December			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Fourier Transform	3.1 The infinite Fourier transform and inverse. 3.2 Definition examples Infinite Fourier sine and cosine transform and examples. 3.3 Definition: Infinite inverse Fourier sine and cosine transform. 3.4 Examples
04	00	04		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Fourier Transform	3.5 Relationship between Fourier transform and Laplace transform. 3.6 Change of Scale Property and examples. 3.7 Modulation theorem. The Derivative theorem. Extension theorem. 3.8 Convolution theorem and examples.
03	00	03		
Month: February			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Finite Fourier transform and inverse, Fourier integrals.	4.1 Finite Fourier sine and cosine transform with examples 4.2 Finite inverse Fourier sine and cosine transform with examples.
04	00	04		
Month: March			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Finite Fourier transform and inverse, Fourier integrals.	4.3 Fourier integral theorem. Fourier sine and cosine integral (without proof) and examples.
03	00	03		

(Mr S. P. Thorat)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. II (Minor) Semester - IV

Subject: Mathematics Course Title: Integral and Fourier Transform (MIN03MAT42)

Month: December			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Fourier Transform	3.1 The infinite Fourier transform and inverse. 3.3 Definition examples Infinite Fourier sine and cosine transform and examples. 3.3 Definition: Infinite inverse Fourier sine and cosine transform. 3.4 Examples
04	00	04		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Fourier Transform	3.5 Relationship between Fourier transform and Laplace transform. 3.6 Change of Scale Property and examples. 3.7 Modulation theorem. The Derivative theorem. Extension theorem. 3.8 Convolution theorem and examples.
04	00	04		
Month: February			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Finite Fourier transform and inverse, Fourier integrals.	4.1 Finite Fourier sine and cosine transform with examples 4.2 Finite inverse Fourier sine and cosine transform with examples.
04	00	04		
Month: March			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Finite Fourier transform and inverse, Fourier integrals.	4.3 Fourier integral theorem. Fourier sine and cosine integral (without proof) and examples.
03	00	03		

Thorat

(Mr. S. P. Thorat)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

Thorat

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: DSC-Mathematics Lab-4

(DSC03MAT49)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Laplace transform.	1.1 Examples on change of scale in Laplace transform. 1.2 Examples on multiplication of power t of Laplace transform. 1.3 Examples of division by t of Laplace transform.
00	10	10		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Inverse Laplace transform.	2.2 Examples of properties of inverse Laplace transform. 2.3 Examples of convolution theorem of inverse Laplace transform.
00	15	15		
Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Fourier transform.	3.1 Examples of multiplication and division by s of inverse Laplace transform 3.2 Solving L.D.E. with constant coefficient by Laplace transformation. 3.4 Examples on infinite Fourier transforms.
00	14	14		
Month: March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Finite Fourier transform and inverse, Fourier integrals.	4.1 Examples on infinite Fourier sine and cosine transform. 4.2 Examples on finite Fourier transforms. 4.3 Examples on finite Fourier sine and cosine transforms.
00	15	15		

(Mr. S. P. Thorat)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. III Semester - VI

Subject: Mathematics Course Title: Complex analysis (DSE-1003F3)

<table>
<tr><td colspan="3">Month: November</td><td>Module/Unit: I</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Analytic function.</td><td rowspan="2">1.1 Functions of a complex variables, limit.
1.2 Theorems on limit, continuity.
1.3 Derivatives, differentiation formulas (without proof).
1.4 Cauchy Riemann equations, necessary and sufficient conditions for differentiation (only statement and examples).
1.5 Analytic function, Harmonic function.</td></tr>
<tr><td>09</td><td>00</td><td>09</td></tr>
<tr><td colspan="3">Month: December</td><td>Module/Unit: II</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Elementary functions.</td><td rowspan="2">2.1 The exponential function, logarithmic function.
2.2 Some identities involving logarithms.
2.3 Complex exponents, trigonometric functions.</td></tr>
<tr><td>07</td><td>00</td><td>07</td></tr>
<tr><td colspan="3">Month: January</td><td>Module/Unit: III</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Integrals.</td><td rowspan="2">3.1 Derivatives of functions, definite integral of functions.
3.2 Contours, contours integral, examples.
3.3 Anti-derivatives (only examples).
3.4 Cauchy-integral formula, derivatives of analytic function.
3.5 Liouville's theorem and fundamental theorem of algebra (without proof).</td></tr>
<tr><td>11</td><td>00</td><td>11</td></tr>
<tr><td colspan="3">Month: February</td><td>Module/Unit: IV</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Series.</td><td rowspan="2">4.1 Convergence of sequences and series (theorem without proof).
4.2 Taylor's series (without proof), Laurent's series (without proof), examples only.
4.3 Isolated singular points, residues.
4.4 Zeros of analytic functions, zero and poles.</td></tr>
<tr><td>09</td><td>00</td><td>09</td></tr>
</table>

(Mr. S. P. Thorat)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of the teacher: Ms. V. B. Patil.

Programme - B. Sc. I

Semester - II

Subject: Mathematics

Course Title: Mathematical Science-II(OEC03MTS21)

Month : December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	HCF, LCM Logarithm Average and Percentage.	1.Examples on HCF and LCM. 2.Examples on Logarithm. 3.Examples on Average. 4.Examples on Percentage.
00	12	12		
Month : January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Profit and Loss Ratio and Proportion Partnership	1.Examples on Profit. 2.Examples on Loss. 3. Examples on Ratio and Proportion. 4. Examples on Partnership.
00	12	12		
Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Pipe and Cisterns Time and Work	1.Examples on Pipe and Cisterns. 2.Examples on Time and Work.
00	08	08		
Month : March			Module/Unit:	Sub-units planned
00	08	08	Time and Distance Train	1.Examples on Time and Distance. 2.Examples on Trains.

(Ms. V. B. Patil.)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE, KOLHAPUR
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of the teacher: Ms. V. B. Patil

Programme - B. Sc. III Semester - VI

Subject: Mathematics Course Title: Optimization Techniques (DSE-1003F4)

Month: November			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	1.Linear Programming Problem.	1.1 Revision of L.P.P. 1.2 Canonical form, standard form of L.P.P. 1.3 Solution of L.P.P by Simplex method and example. 1.4 Solution of L.P.P by Big – M method and examples.
09	00	09		
Month: December			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	2.Transportation Problem.	2.1 Basics of Transportation problem, Basic Definitions. 2.2 Initial Solution: North – West corner method and examples, Matrix minima method and examples. 2.3 Vogel's approximation method and examples. 2.4 MODI method and examples. 2.5 Unbalanced transportation problem and examples.
10	00	10		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	3. Assignment Problem.	3.1 Introduction to Assignment problem. 3.2 Hungarian method and examples. 3.3 Unbalanced Assignment problem and examples. 3.4 Assignment problems with restrictions and examples.
11	00	11		
Month: February			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	4.Theory of Games.	4.1 Basics definitions, Saddle point and examples. 4.2 Algebraic method for size game and examples, Arithmetic method for size game and examples. 4.3 Principal of dominance, Dominance method and examples. 4.4 Sub-game method for size game and examples. 4.5 Graphical method for size game and examples.
08	00	08		

(Ms. V. B. Patil.)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR * (Empowered Autonomous) * ESTD JUNE 1964

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. V. B. Patil.

Programme - B. Sc. III | Semester – VI

Subject: Mathematics | Course Title: Core course practical in Mathematics (CCPM-IV)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Assignment Problems	1. Assignment Problems [Travelling Salesman Problem] 2. Assignment Problems [Unbalanced Problem]
00	16	16		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Game Theory	1. Two by two (2 X 2) games with saddle point. 2. Algebraic method of Two by two (2 X 2) games.
00	16	16		
Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Game Theory	1. Arithmetic method of Two by two (2 X 2) games. 2. Dominance Method for games.
00	15	15		
Month : March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Graphical Method.	1. Sub Game Method for 2 X n, m X 2 games. 2. Graphical method for 2 x n games and m x 2 games.
00	14	14		

(Ms. V. B. Patil.)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR (An Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE KOLHAPUR

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. I Semester – II

Subject: Mathematics Course Title: Discrete Mathematics

(2DSC03MAT21)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Propositional Calculus	**Revision** 1. Propositional Logic. 2. Propositional equivalence.
04	00	04		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Propositional Calculus	**Predicates and Quantifiers:** 1. Pedicate, n-place Pedicate, n-ary Pedicate. 2.Quantification and Quantifiers, Universal Quantifier, Existential Quantifier, Quantifiers with restricted domains. 3.Logical Equivalence involving Quantifiers.
04	00	04		
Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Propositional Calculus	**Rules of Inference:** 1.Argument in propositional Logic. 2.Validity Argument (Direct and Indirect methods) 3.Rules of Inference for Propositional Logic.
04	00	04		
Month : March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Propositional Calculus	**Rules of Inference:** 4. Building Arguments 5. Numerical Problems on inference
03	00	03		

(Mr. G. B. Kolhe)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR * (Empowered Autonomous) * ESTD JUNE 1964

(Prof. S.P. Thorat)

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

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. II Semester – IV

Subject: Mathematics Course Title: Integral Transform

(DSC03MAT42)

<table>
<tr><td colspan="3">Month: December</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Laplace Transform</td><td rowspan="2">1. Laplace Transform: Definitions; Piecewise continuity, Function of exponential order, Function of class A
2. Existence theorem of Laplace transform. Laplace transforms of standard functions. First shifting theorem and Second shifting theorem and examples,</td></tr>
<tr><td>04</td><td>00</td><td>04</td></tr>
<tr><td colspan="3">Month: January</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Laplace Transform</td><td rowspan="2">3. Change of scale property and examples, Laplace transform of derivatives and examples, Laplace transform of integrals and examples.
4. Multiplication by power of t and examples. Division by t and examples</td></tr>
<tr><td>04</td><td>00</td><td>04</td></tr>
<tr><td colspan="3">Month : February</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Inverse Laplace Transform and application:</td><td rowspan="2">1 Definition Standard results of inverse Laplace transform, Examples
2 First shifting theorem and Second shifting theorem and examples. Change of scale property and Inverse Laplace of derivatives, examples</td></tr>
<tr><td>04</td><td>00</td><td>04</td></tr>
<tr><td colspan="3">Month : March</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Inverse Laplace Transform and application:</td><td rowspan="2">3 The Convolution theorem and Multiplication by S, examples. Division by S, inverse Laplace by partial fractions, examples
4 Solving linear differential equations with constant coefficients by Laplace transform</td></tr>
<tr><td>04</td><td>00</td><td>04</td></tr>
</table>

G.B.Kolhe

(Mr. G. B. Kolhe)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR * (Empowered Autonomous) * ESTD JUNE 1964

Thorat

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. II Semester – IV

Subject: Mathematics Course Title: Laplace and Fourier Transformations

(MIN03MAT42)

<table>
<tr><td colspan="3">Month: December</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Laplace Transform</td><td rowspan="2">5. Laplace Transform: Definitions; Piecewise continuity, Function of exponential order, Function of class A
6. Existence theorem of Laplace transform. Laplace transforms of standard functions. First shifting theorem and Second shifting theorem and examples,</td></tr>
<tr><td>04</td><td>00</td><td>04</td></tr>
<tr><td colspan="3">Month: January</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Laplace Transform</td><td rowspan="2">7. Change of scale property and examples, Laplace transform of derivatives and examples, Laplace transform of integrals and examples.
8. Multiplication by power of t and examples. Division by t and examples</td></tr>
<tr><td>04</td><td>00</td><td>04</td></tr>
<tr><td colspan="3">Month : February</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Inverse Laplace Transform and application:</td><td rowspan="2">1 Definition Standard results of inverse Laplace transform, Examples
2 First shifting theorem and Second shifting theorem and examples. Change of scale property and Inverse Laplace of derivatives, examples</td></tr>
<tr><td>04</td><td>00</td><td>04</td></tr>
<tr><td colspan="3">Month : March</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Inverse Laplace Transform and application:</td><td rowspan="2">3 The Convolution theorem and Multiplication by S, examples. Division by S, inverse Laplace by partial fractions, examples
4 Solving linear differential equations with constant coefficients by Laplace transform</td></tr>
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G.B.Kolhe

(Mr. G. B. Kolhe)

Name and Signature of Teacher

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. II

Semester - IV

Subject: Mathematics

Course Title: DSC-Mathematics Lab-4

(DSC03MAT49)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Recurrence relation	1. Examples on formation of recurrence relation 2. Examples of Homogeneous solution linear recurrence relation with constant coefficient
00	15	15		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Recurrence relation	3. Examples of total solution linear recurrence relation with constant coefficient 4. Examples on generating function 5. Examples on Application of generating function to recurrence relation
00	16	16		
Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Graph Theory	6. Examples on path, walk, and cycles 7. Examples on subgraph and spanning subgraph
00	14	14		
Month: March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Graph Theory	8. Examples on operations of graph 9. Examples on matrix representation of graph
00	16	16		

G. B. Kolhe

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. III Semester – VI

Subject: Mathematics Course Title: Linear Algebra

(DSE-1003F2)

<table>
<tr><td colspan="3">Month: December</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Vector spaces</td><td rowspan="2">1) Vector Spaces, Subspaces, Sum of Subspaces,
2) direct sum, Quotient Spaces, Homomorphisms or Linear Transformations
3) kernel, range, Linear Span, finite dimensional vector space,
4) Linear Dependence and Independence, basis, dimension of V</td></tr>
<tr><td>12</td><td>00</td><td>12</td></tr>
<tr><td colspan="3">Month: January</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Inner product spaces</td><td rowspan="2">1) Norm of a Vector, Inner product spaces,
2) Orthogonality, Orthonormal Set</td></tr>
<tr><td>12</td><td>00</td><td>12</td></tr>
<tr><td colspan="3">Month : February</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Linear Transformations</td><td rowspan="2">1) Algebra of Linear Transformations, Invertible Linear Transformations,
2) singular transformation, Matrix of a Linear Transformation and examples</td></tr>
<tr><td>11</td><td>00</td><td>11</td></tr>
<tr><td colspan="3">Month : March</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Eigen Values and Eigen Vectors</td><td rowspan="2">1) Eigen Values and Eigen Vectors,
2) Characteristic Polynomials, Characteristic Polynomial of a Linear Operator</td></tr>
<tr><td>12</td><td>00</td><td>12</td></tr>
</table>

(Mr. G. B. Kolhe)

Name and Signature of Teacher

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. P. P. Kulkarni

Programme - B. Sc. I Semester - II

Subject: Mathematics Course Title: Discrete Mathematics(2DSC03MAT22)

Month: December			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Graph Theory	1.Basic Terminology 2. Special types of Graphs (Complete graph, Regular graph, Bipartite and complete Bipartite graph)
04	00	04		
Month: January			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Graph Theory	1. Isomorphism 2. Adjacency and Incidence Matrix of Graph
05	00	05		
Month: February			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Graph Theory	1.Subgraphs, vertex deletion, Edge addition. 2.Complement of a graph and self-complementary graphs.
04	00	04		
Month: March			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Graph Theory	1.Union, Intersection and Product of graphs. 2. Problems based on above points
04	00	04		

Name and Signature of Teacher

(Ms. Prajakta. P. Kulkarni)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE, KOLHAPUR

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. P. P. Kulkarni

Programme - B. Sc. I Semester - II

Subject: Mathematics Course Title: DSC Mathematics Lab II(DSC03MAT29)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Linear differential equation with constant coefficients	1.Orthogonal Trajectories to Polar Curves 2.Linear Differential Equation with constant Coefficient
00	09	09		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Linear differential equation with constant coefficients	1. Examples on D(y) = X, where X is of the form $e^{ax}, where\ a\ is\ constan,$ $\sin(ax)\ and\ \cos(ax)$ 2. Examples on D(y) = X, where X is of the form x^m,m is positive integer $e^{ax}V, where\ V\ is\ a\ function\ of\ x$
00	08	08		
Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Propositional Calculus	1.Test the validity of arguments using Truth table 2. show implication without using truth table
00	08	08		
Month: March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Graph Theory	1.Draw the graph represented by the give adjacency matrix 2.Find the incidence matrix of the graphs
00	12	12		

Name and Signature of Teacher

(Ms. Prajakta. P. Kulkarni)

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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. P. P. Kulkarni

Programme - B. Sc. II Semester – IV

Subject: Mathematics Course Title: Discrete Mathematics (DSC03MAT41)

Month: December			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Recurrence relation:	1.Models of Recurrence Relations- Compound Interest, Tower of Hanoi, Bit Strings, Fibonacci Numbers (Counting Rabbits) 2.linear recurrence relation with constant coefficients.
04	00	04		
Month: January			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Recurrence relation:	1. Homogeneous solutions & examples 2.Particular solutions and total solutions, Examples.
04	00	04		
Month: February			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Generating functions:	1.Generating functions 2. Basic properties of generating functions
04	00	04		
Month: March			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Generating functions:	1.Examples of generating function. 2.Application of generating function to recurrence relation
03	00	03		

Name and Signature of Teacher

(Ms. P. P. Kulkarni)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

(Prof. S.P. Thorat)

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. P. P. Kulkarni

Programme - B. Sc. II Semester - IV

Subject: Mathematics Course Title: Graph Theory and Recurrence Relations (Minor)

(MIN03MAT41)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Recurrence relation:	1.Models of Recurrence Relations- Compound Interest, Tower of Hanoi, Bit Strings, Fibonacci Numbers (Counting Rabbits) 2.linear recurrence relation with constant coefficients.
04	00	04		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Recurrence relation	1. Homogeneous solutions & examples 2.Particular solutions and total solutions, Examples.
04	00	04		
Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Generating functions	1.Generating functions 2. Basic properties of generating functions
04	00	04		
Month: March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Generating functions	1.Examples of generating function. 2.Application of generating function to recurrence relation
03	00	03		

Name and Signature of Teacher

(Ms. P. P. Kulkarni)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. P. P. Kulkarni

Programme - B. Sc. III

Semester – VI

Subject: Mathematics

Course Title: Metric Space (DSE1003F1)

<table>
<tr><td colspan="3">Month: November</td><td>Module/Unit: I</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Limit and metric space:</td><td rowspan="2">1.Limit of a function on the real line
2.Metric spaces, Limits in metric spaces.</td></tr>
<tr><td>06</td><td>00</td><td>06</td></tr>
<tr><td colspan="3">Month: December</td><td>Module/unit: ii</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Continuous function
On
Metric space</td><td rowspan="2">1.Functions continuous at a point on the real line, Reformulation
2.Functions continuous on a metric space
3.Open sets, Closed sets
4.Discontinuous functions on R^1</td></tr>
<tr><td>12</td><td>00</td><td>12</td></tr>
<tr><td colspan="3">Month: January</td><td>Module/unit: iii</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Connectedness and completeness:</td><td rowspan="2">1.More about open sets
2.connected sets, bounded sets and totally bounded sets
3.Complete metric spaces</td></tr>
<tr><td>11</td><td>00</td><td>11</td></tr>
<tr><td colspan="3">Month: February</td><td>Module/unit: iv</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Compactness:</td><td rowspan="2">1.Compact metric spaces
2.Continuous functions on compact metric spaces, 3. Continuity of the inverse function
4.Uniform continuity</td></tr>
<tr><td>12</td><td>00</td><td>12</td></tr>
</table>

Name and Signature of Teacher

(Ms. P. P. Kulkarni)

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Com. I Semester - II

Subject: Mathematics Course Title: Business Mathematics-II(2OEC02MAT21)

Month: December			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Permutation and Combination	1.1 Sum and product rule, permutation. 1.2 Permutation with restrictions, circular permutation. 1.3 Combinations. 1.4 Some properties and standard results.
15	00	15		
Month: January			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Differentiability and it's Applications	2.1 Definition, Methods of differentiation of two functions. 2.2 Second order derivative. 2.3 Maxima and minima. 2.4 Cost, Average cost and marginal cost. 2.5 Revenue and marginal revenue. 2.6 Elasticity of demand.
17	00	17		
Month : February			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Integration:	3.1 Integration- An Anti-derivative process. 3.2 Standard forms. 3.3 Method integration by substitution and by parts. 3.4 Definite integral and their properties.
13	00	13		
Month : March			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Transportation and Assignment problems:	4.1 Reduced matrix method with examples. 4.2 Maximization in Assignment problem. 4.3 Unbalanced assignment problem. 4.4 North-west corner rule.
18	00	18		

(Ms. A. M. Sathe)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. II (Major) Semester - IV

Subject: Mathematics Course Title: Discrete mathematics (DSC03MAT41)

Month: December			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Basics of Graph theory	3.1 Definitions, Graph, Types of edges. 3.2 Types of graphs, degree of a vertex. 3.3 Undirected and directed graph/digraph.
04	00	04		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Basics of Graph theory	3.4 Indegree and outdegree of vertex. 3.5 Handshaking lemma. 3.6 Examples on handshaking lemma.
04	00	04		
Month : February			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Paths and circuits.	4.1 Walk, trail, path, cycle, circuit, tree. 4.2 Subgraph- spanning subgraph. 4.3 Examples.
04	00	04		
Month : March			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Paths and circuits.	4.4 Operations of graph. 4.5 Examples on operations of graph. 4.6 Matrix representation of graph. 4.7 Examples on matrix representation of a matrix.
04	00	04		

(Ms. A. M. Sathe)

Name and Signature of Teacher

VIVEKANAND COLLEGE KOLHAPUR (Empowered Autonomous) ESTD JUNE 1964

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VIVEKANAND COLLEGE, KOLHAPUR
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. II (Minor) Semester - IV

Subject: Mathematics Course Title: Graph theory and recurrence relation (MIN03MAT41)

Month: December			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Basics of Graph theory	3.1 Definitions, Graph, Types of edges. 3.2 Types of graphs, degree of a vertex. 3.3 Undirected and directed graph/digraph.
04	00	04		
Month: January			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Basics of Graph theory	3.4 Indegree and outdegree of vertex. 3.5 Handshaking lemma. 3.6 Examples on handshaking lemma.
04	00	04		
Month : February			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Paths and circuits.	4.1 Walk, trail, path, cycle, circuit, tree. 4.2 Subgraph- spanning subgraph. 4.3 Examples.
04	00	04		
Month : March			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Paths and circuits.	4.4 Operations of graph. 4.5 Examples on operations of graph. 4.6 Matrix representation of graph. 4.7 Examples on matrix representation of a matrix.
04	00	04		

(Ms. A. M. Sathe)

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. II Semester - IV

Subject: Mathematics Course Title: MIN- Mathematics Lab-4(MIN03MAT49)

Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Path, Walk and Cycle	1.1 Examples on Path, Walk and Cycles. 1.2 Examples on operations of graph (Union, Intersection, complement) 1.3 Examples on matrix representation of graph.
00	12	12		

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Name and Signature of Teacher

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

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

Programme - B. Sc. III

Semester – VI

Subject: Mathematics

Course Title: Core course practical in Mathematics (CCPM-V)

<table>
<tr><td colspan="3">Month: November</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Trapezoidal rule</td><td rowspan="2">1. Trapezoidal rule.</td></tr>
<tr><td>00</td><td>09</td><td>09</td></tr>
<tr><td colspan="3">Month: December</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Simpson's 1/3 rd rule</td><td rowspan="2">1. Simpson's 1/3 rd rule.</td></tr>
<tr><td>00</td><td>06</td><td>06</td></tr>
<tr><td colspan="3">Month : January</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Simpson's 3/8 th rule.</td><td rowspan="2">1. Simpson's 3/8 th rule.</td></tr>
<tr><td>00</td><td>09</td><td>09</td></tr>
<tr><td colspan="3">Month : February</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Euler's method.</td><td rowspan="2">1. Euler's method.</td></tr>
<tr><td>00</td><td>08</td><td>08</td></tr>
</table>

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Name and Signature of Teacher

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Vivekanand College Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. A. D. Patil
Programme: M. Sc. I
Subject: Mathematics

Semester: II
Course Title: Numerical Analysis-II

Month: January			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Interpolation, differentiation and integration:	1. Lagrange and Newton interpolations, Truncation error bounds, Newtons divided difference interpolation, finite difference operators. 2. Numerical differentiation, methods based on interpolation, Numerical integration, methods based on interpolation. 3. Newton-Cotes methods, Error estimates for trapezoidal and Simpon's rule.
15	00	15		
Month: February			**Module/Unit: II**	**Sub-units planned**
Lectures	Practicals	Total	Numerical solution of differential equations:	1. Euler method, analysis of Euler method, Backward Euler method, midpoint method, order of a method. 2. Taylor series method, Explicit Runge-Kutta Methods of order two and four, convergence and stability of numerical methods, Truncation error. Error analysis.
15	00	15		

(Ms. A. D. Patil)
Name And Sign of Faculty

VIVEKANAND COLLEGE KOLHAPUR * (Empowered Autonomous) * ESTD JUNE 1964

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DEPARTMENT OF MATHEMATICS
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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. A. D. Patil
Programme: M. Sc. II
Subject: Mathematics

Semester: IV
Course Title: Partial Differential Equations

Month: January			Module/Unit: I	Sub-units planned
Lectures	Practical	Total	Partial Differential Equations	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. 5. Compatible systems of first order partial differential equations.
18	00	18		
Month: February			Module/Unit: II	Sub-units planned
Lectures	Practical	Total	Cauchy Problem	1. Charpits method, 2. Jacobi method of solving partial differential equations, 3. Cauchy Problem, 4. Method of characteristics to find the integral surface of a quasi linear
15	00	15		
Month: March			Module/Unit: III	Sub-units planned
Lectures	Practical	Total	Method of separation of variables	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 Uniqueness of solution of wave equation
17	00	17		
Month: April			Module/Unit: IV	Sub-units planned
Lectures	Practical	Total	Laplace equation	1. Laplace equation, Solution of Laplace equation, 2. Dirichlet's problems and Neumann problems. 3. maximum and minimum principles 4. Stability theorem.
16	00	16		

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Department of Mathematics
Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. A. D. Patil
Programme - M.Sc.-II Semester-IV

Subject: Mathematics Course Title: Combinatorics

Month: January			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Permutations and combinations	1.1 The sum Rule and product Rule. 1.2 Permutations and combinations. 1.3 The Pigeonhole Principle. 1.4 Ramsey Numbers, Catalan Numbers & Stirling Numbers.
16	00	16		
Month: February			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Inclusion-Exclusion principle	2.1 Generalized Permutations & Combinations. 2.2 Inclusion – Exclusion principle. 2.3 Derangements. 2.4 Combinatorial Number theory.
17	00	17		
Month: March			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Generating functions	3.1 Rook- Polynomial. 3.2 Ordinary and Exponential generating functions. 3.3 Recurrence Relations. 3.4 Fibonacci sequence.
19	00	19		
Month: April			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Group Theory in Combinatorics	4.1 Group Theory in Combinatorics. 4.2 The Burnside Frobenius Theorem. 4.3 Permutation Groups and Their Cycle Indices.
16	00	16		

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Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Mr. A. A. Patil
Programme: M. Sc. I
Subject: Mathematics

Semester: II
Course Title: Advance Calculus

Month: January			Module/Unit: I	Sub-units planned
Lectures	Practicals	Total	Sequences and series of functions	1.Sequences and series of functions - Pointwise & uniform convergence of sequences of functions continuity, Cauchy condition for uniform convergence. 2.Uniform convergence and Riemann integration, , uniform convergence and double sequences, mean convergence. 3.Power series, multiplication of power series, substitution theorem, reciprocal of power series 4.The Taylor series generated by function, Bernstein's theorem, Binomial series.
17	00	17		
Month: February			Module/Unit: II	Sub-units planned
Lectures	Practicals	Total	Multivariable differential Calculus:	1.Multivariable differential Calculus: The Directional derivatives, directional derivatives and total derivative. 2.Total derivatives expressed in terms of partial derivatives, Jacobin matrix, mean value theorem for differentiable functions. 3.A sufficient condition for differentiability, Taylor's formula for functions from R. to R. Implicit Functions 4.Extrema of real valued functions of one variable, Extrema of real valued functions of several.
16	00	16		
Month: March			Module/Unit: III	Sub-units planned
Lectures	Practicals	Total	Functions of Bounded Variations	1.Functions of Bounded Variation& Rectifiable Curves - Introduction, Properties of monotonic functions. 2.functions of Bounded Variation (B.V.), Total Variation (T.V.), additive property of TV. 3.function of B.V. expressed as the difference of increasing functions, continuous functions of B.V. 4. Curves & paths, rectifiable paths, line integral.
18	00	18		
Month: April			Module/Unit: IV	Sub-units planned
Lectures	Practicals	Total	Riemann Stieltje's Integral	1.The Riemann-Stieltje's (R.S.) Integral Introduction, notation, linear property, integration by parts. 2.Change of variable, reduction to Riemann integration, Step functions as integrator,Euler's summation formula. 3. Additive & linearity property of upper & lower integrals, Riemann's condition, Comparison theorem. 4.Integration of B.V. Necessary condition for existence of RS integrals.
15	00	15		

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Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Mr. A. A. Patil
Programme: M. Sc. II
Subject: Mathematics

Semester: IV
Course Title: Field Theory

Month: January			Module/Unit: I	Sub-units planned
Lectures	Practical	Total	Field Extensions	1.1 Extension of a field, Algebraic extensions, 1.2 Algebraically closed fields 1.3 Derivatives and multiple roots, Finite Fields.
17	00	17		
Month: February			Module/Unit: II	Sub-units planned
Lectures	Practical	Total	Galois Theory	2.1 Separable and normal extensions 2.2 Automorphism groups and fixed fields 2.3 Fundamental theorem of Galois theory.
16	00	16		
Month: March			Module/Unit: III	Sub-units planned
Lectures	Practical	Total	Finite Fields	3.1 Finite Fields Prime fields 3.2 Fundamental theorem of algebra 3.3 Cyclic extensions 3.4 Cyclotomic extensions.
17	00	17		
Month: April			Module/Unit: IV	Sub-units planned
Lectures	Practical	Total	Applications of Galois theory	4.1 Constructions by ruler and compass 4.2 Solvable groups 4.3 Polynomials solvable by radical.
16	00	16		

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Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Mr. G. B. Kolhe
Programme: M. Sc. I
Subject: Mathematics

Semester: II
Course Title: Linear Algebra

Month: January			Module/Unit: I	Sub-units planned
Lectures	Practical	Total	Vector Space	1. Direct sum of a vector space 2. Dual Spaces, Annihilator of a subspace, 3. Quotient Spaces 4. Algebra of Linear transformations.
18	00	18		
Month: February			Module/Unit: II	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: March			Module/Unit: III	Sub-units planned
Lectures	Practical	Total	Canonical 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
17	00	17		
Month: April			Module/Unit: IV	Sub-units planned
Lectures	Practical	Total	Symmetric bilinear forms	1. Hermitian, Self adjoint, Unitary and normal linear transformation 2. Symmetric bilinear forms 3. skew symmetric bilinear forms 4. Group preserving bilinear forms
16	00	16		

Name And Sign of Faculty

G.B.Kolhe

(Mr. G. B. Kolhe)

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Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. P. P. Kulkarni

Programme: M. Sc. I

Subject: Mathematics

Semester: II

Course Title: General Topology

Month: January			Module/Unit: I	Sub-units planned
Lectures	Practical	Total	Topological spaces	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 6. Hereditary Properties
18	00	18		
Month: February			Module/Unit: II	Sub-units planned
Lectures	Practical	Total	Connected spaces,	1 Connected spaces, components 2 connected subspaces of real line, compact space one point compactification, 3 continuous function 4. Homeomorphisms 5. Topological Properties
15	00	15		
Month: March			Module/Unit: III	Sub-units planned
Lectures	Practical	Total	Separable spaces	1. Separation Axioms: spaces 2. First and second axiom spaces 3. Separable spaces 4. Lindelof spaces 5. Regular and spaces 6. Normal and space
17	00	17		
Month: April			Module/Unit: IV	Sub-units planned
Lectures	Practical	Total	Completely regular spaces	1. Completely regular spaces 2. Completely normal and spaces 3. Product spaces
16	00	16		

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Ms. P. P. Kulkarni

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Department of Mathematics
Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. A. M. Sathe
Programme: M. Sc. II
Subject: Mathematics

Semester: IV
Course Title: Integral Equations

Month: January			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Integral equations	1.Classification of linear integral equations, Conversion of initial value problem to Volterra integral equation, Conversion of boundary value problem to Fredholm integral equation 2. Separable kernel, Fredholm integral equation with separable kernel, Fredholm alternative. Homogeneous Fredholm equations and eigenfunctions.
18	00	18		
Month: February			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	Fredholm integral equations	1.Solutions of Fredholm integral equations by: Successive approximations Method, Successive substitution Method, 2.Adomian decomposition method, Modified decomposition method, Resolvent kernel of Fredholm equations and its properties 3. Solutions of Volterra integral equations: Successive approximations method, Neumann series, Successive substitution Method.
15	00	15		
Month: March			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	Volterra integral equations	1.Solution of Volterra integral equations by Adomian decomposition method, and the modified decomposition method, 2.Resolvent kernel of Volterra equations and its properties, Convolution type kernels, Applications of Laplace and Fourier transforms to solutions of Volterra integral equations, 3.Symmetric Kernels: Fundamental properties of eigenvalues and eigenfunctions for symmetric kernels, expansion in eigenfunctions and bilinear form
16	00	16		
Month: April			**Module/Unit:**	**Sub-units planned**
Lectures	Practical	Total	Symmetric integral equations	1.Hilbert Schmidt Theorem and its consequences, Solution of symmetric integral equations, Operator method in the theory of integral equations, 2.Solution of Volterra and Fredholm integrodifferential equations by Adomian decomposition method 3. Green's function: Definition, Construction of Green's function and its use in solving boundary value problems.
15	00	15		

(Ms. A. M. Sathe)
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Academic Year: 2024-25

ANNUAL TEACHING PLAN

Name of the teacher: Ms. S. J. Koshti

Programme - M.Sc.-I | Semester-II

Subject: Mathematics | Course Title: Number Theory

Month: January			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	00	16		
Month: February			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, Wilsons's theorem and applications.
17	00	17		
Month: March			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 $\tau$and σ, Mobius function and Mobius inversion formula, Properties of these functions
15	00	15		
Month: April			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.
18	00	18		

Koshti

(Ms. Shweta J. Koshti)
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Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. S. J. Koshti

Programme - B. Sc. I | Semester – II

Subject: Mathematics | Course Title: Differential Equation-I (DSC03MAT21)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Ordinary differential equations of first order and first degree	1. Introduction. 2. Exact differential equations. 3.Necessary and sufficient condition for exactness.
04	00	04		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Ordinary differential equations of first order and first degree:	4.Differential equations reducible to exact, integrating factors with rules. 5.Linear differential equations. 6.Differential equations reducible to linear.
05	00	05		
Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Ordinary differential equations of first order and first degree:	7.Applications of differential equations of first order and first degree: 8.Law of growth. 9.Law of decay.
03	00	03		
Month: March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Ordinary differential equations of first order and first degree:	10. Newton's law of cooling. 11.Orthogonal trajectories to Cartesian and Polar curves. 12.Examples based on 1 to 5 .
05	00	05		

(Ms. S. J. Koshti)

Name and Signature of Teacher

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Department of Mathematics
Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. S. J. Koshti

Programme - B. Sc. I

Semester – II

Subject: Mathematics

Course Title: DSC Mathematics Lab-II

(2DSC03MAT29)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Ordinary differential equations of first order and first degree	1. Differential equations reducible to exact 2. Linear differential equations
00	08	08		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Ordinary differential equations of first order and first degree	3. Bernoulli's Differential equations 4. Law of growth
00	08	08		
Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Ordinary differential equations of first order and first degree	5. Law of Decay 6. Newton's law of cooling
00	08	08		
Month :March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Ordinary differential equations of first order and first degree	7. Orthogonal Trajectories to Cartesian Curves
00	04	04		

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(Ms. S.J. Koshti)

Name and Signature of Teacher

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of the teacher: Ms. S. J. Koshti

Programme - B. Sc. II | Semester – II

Subject: Mathematics | Course Title: Numerical Method using Python (VSC03MAT49)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Numerical Method using Python	1.File Handling 2.Python Data Structures – I: String, List and Tuples, and operations
00	08	08		
Month: January			**Module/Unit:**	**Sub-units planned**
Lectures	Practicals	Total	Numerical Method using Python	3.Python Data Structures – II: Dictionary, Sets and their operations 4.Python Data Structures – III: Arrays and their Operations 5.System Of linear algebraic equations: Gaussian Elimination, LU Decomposition
00	16	16		
Month: February			**Module/Unit:**	**Sub-units planned**
Lectures	Practicals	Total	Numerical Method using Python	6.Initial Value Problem-II: RK-2, RK-4 7.Magic Square 8.Collatz Conjecture
00	16	16		
Month: March			**Module/Unit:**	**Sub-units planned**
Lectures	Practicals	Total	Numerical Method using Python	9.Graph Theory: Network 10.Data Visualisation in Python
00	12	12		

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Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of the teacher: Ms. S. J. Koshti

Programme - B. Sc. II Semester – II

Subject: Mathematics Course Title: MIN-Mathematics Lab-4

(MIN03MAT49)

<table>
<tr><td colspan="3">Month: December</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Recurrence Relation</td><td rowspan="2">1.Examples on formation of recurrence relation
2.Examples of Total Solutions of Linear Recurrence relation with constant coefficient.
3.Examples on Generating function.</td></tr>
<tr><td>00</td><td>12</td><td>12</td></tr>
<tr><td colspan="3">Month: January</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Laplace Transforms.</td><td rowspan="2">4.Examples on Properties of Laplace Transforms.
5.Examples of Properties of Inverse Laplace Transforms.
6.Examples of convolution theorem of Inverse Laplace Transforms.</td></tr>
<tr><td>00</td><td>12</td><td>12</td></tr>
<tr><td colspan="3">Month: March</td><td>Module/Unit:</td><td>Sub-units planned</td></tr>
<tr><td>Lectures</td><td>Practicals</td><td>Total</td><td rowspan="2">Fourier Transform</td><td rowspan="2">7.Solving L. D. E. with constant coefficient by Laplace Transformation.
8.Examples on Infinite Fourier Transform
9.Examples on Finite Fourier Transform</td></tr>
<tr><td>00</td><td>13</td><td>13</td></tr>
</table>

(Ms. S.J. Koshti)

Name and Signature of Teacher

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Vivekanand College, Kolhapur (An Empowered Autonomous Institute)
Department of Mathematics
Academic Year: 2024-2025
Annual Teaching Plan

Name of the teacher: Ms. S. J. Koshti

Programme - B. Sc. III | Semester – VI

Subject: Mathematics | Course Title: Core course practical in Mathematics (CCPM-V)

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Euler's Method	1. Euler's Modified Method
00	04	04		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Second order Runge-Kutta method	1. Second order Runge Kutta Method
00	12	12		
Month : : January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Fourth order Runge Kutta Method	1. Fourth order Runge-Kutta method.
00	10	10		
Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Power method (Maximum eigen value)	1. Power method (Maximum eigen value).
00	09	09		

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Department of Mathematics

Academic Year: 2024-2025

Annual Teaching Plan

Name of the teacher: Ms. S. J. Koshti.

Programme - B. Sc. III | Semester – VI

Subject: Mathematics | Course Title: Core course practical in Mathematics (CCPM-VI)

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Introduction to Python	1.modules and Packages in Python 2.Operations on Set
00	16	16		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Numerical method using python	1.Numerical Integration i)Trapezoidal, ii)Simpson's $(1/3)^{rd}$, iii)Simpson's $(3/8)^{th}$.
00	18	18		
Month : February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Numerical method using python	1.Roots of Equation i)Bisection method, ii) Newton- Raphson Method
00	15	15		
Month : March			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Numerical method using python	1.Initial Value problem i)Euler method ii)Euler Modified method iii)RK2 method iv)RK4 method
00	16	16		

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